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ARALIACEAE IMPERII JAPONICI

T. NAKAI

Acanthopanax Miq.

Acanthopanax Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 10 (1863).—Seemann mss. ex Seemann in Jour. Bot. v. 238 (1867).—Bentham & Hooker, Gen. Pl. I. 938 (1867), pro parte.—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 49 (1897), pro parte.

Panax subgen. *Acanthopanax* Decaisne & Planchon in Rev. Hort. 1854, 105.
Kalopanax Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 10 (1863), pro parte.
Panax De Candolle, Prodr. IV. 252 (1830), pro parte.—G. Don, Gen. Syst. III. 384 (1834).

Sect. I. ORTHACANTHOPANAX Nakai, sect. nov.

Acanthopanax Sect. II. *Euacanthopanax* Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 50 (1894), pro parte.

Styli basi, interdum ad apicem coaliti; umbellae glabrae v. subglabrae; flores longe pedicellati.

Subsect. 1. ZANTHOXYLOPANAX Nakai.

Acanthopanax Sekt. *Zanthoxylopanax* Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 26 (1918).

Folia trifoliata: inflorescentia in apice rami annotini elongati terminalis.

Acanthopanax trifoliatum Merrill in Philipp. Jour. Sci. I. suppl. p. 217 (1906).—Schneider, Ill. Handb. Laubholzk. II. 427 (1909).—Rehder in Bailey, Stand. Cycl. Hort. I. 193 (1914).—Harms & Rehder in Sargent, Pl. Wilson. VI. 563 (1916).—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 26 (1918).

Zanthoxylum trifoliatum Linnaeus, Spec. 270 (1753).—Lamarck, Encycl. Méth. II. 40 (1786).
Panax aculeatum Aiton, Hort. Kew III. 448 (1789).—Willdenow, Spec. IV. 1125 (1805).—Steudel, Nomencl. 583 (1821).—De Candolle, Prodr. IV. 252 (1830).—G. Don, Gen. Syst. III. 384 (1834).
Plectronia chinensis Loureiro, Fl. Cochinch. 162 (1790).
Panax Loureirianum De Candolle, Prodr. IV. 252 (1830).
Acanthopanax aculeatum Seemann in Jour. Bot. v. 238 (1867).—C. B. Clarke in Hooker, Fl. Brit. Ind. II. 726 (1879).—Forbes & Hemsley in Jour. Linn. Soc. XXIII. 339 (1887).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 50 (1894); in Bot. Jahrb. XXIX. 489 (1900).—Schneider, Ill. Handb. Laubholzk. II. 427, fig. 290 i–i[1] (1909).—Harms & Rehder in Sargent, Pl. Wilson. II. 564 (1916), pro parte.
Acanthopanax sepium Seemann in Jour. Bot. v. 239 (1867).

FORMOSA: Mt. Niitakayama, *T. Kawakami* et *U. Mori*; Kelung, *T. Makino;* Tappo, *Nagasawa*, no. 3139; near Sozan, prov. Taihoku, *E. H. Wilson*, nos. 11221, 10774; Boryo to Kararu, prov. Koshun, *E. H. Wilson*, no. 11016; Tamsui, *A. Henry*, no. 1460; South Cape, *A. Henry*, no. 335; Bankinsing, *A. Henry*, no. 1516; sine loco speciali, *R. Oldham*, no. 200.

DISTRIBUTION: also Philippines, China, Cochinchina and India.

Henry's nos. 12770 and 12561 determined by Harms as *Acanthopanax trifoliatum* are not that species, but are *Eleutherococcus leucorhizus* Oliver (*Acanthopanax leucorhizus* Harms).

Subsect. 2. EUACANTHOPANAX Nakai.

Acanthopanax Sekt. *Euacanthopanax* Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 50 (1897), pro parte; in Mitt. Deutsch. Dendr. Ges. XXVII. 18 (1918).

Folia digitatim quinata. Umbellae vulgo solitariae laterales; styli bifidi v. fere ad apicem connati.

Foliola varie inciso-serrata, supra sparsissime pilosa, subtus pilosa . . *A. nipponicum.*
Foliola nunquam inciso-serrata.
Pedunculi elongati foliis aequilongi. Foliola incurvato-serrulata, parva, basi rufo-pilosa . . . . . *A. kiusianum.*
Pedunculi foliis distincte breviores.
Foliola mucronato-serrata vel submucronato-grandiserrata. . . *A. commixtum.*
Foliola crenato-serrata vel spinuloso-crenata.
Foliola incurvato-crenulata . . . . . *A. spinosum.*
Foliola subspinuloso-crenulata . . . . . *A. koreanum.*

Acanthopanax nipponicum Makino in Jour. Jap. Bot. II. 5, 19 (1921).

Frutex; rami elongati, cinereo-fuscescentes, sub folio 1-aculeati aculeis rectis rigidis. Petioli glabri vel apice minute spinulosi; foliola 5, obovata vel late obovata varie inciso-serrata, supra viridia, sparsissime pilosa, infra pallida pilosa. Umbellae e gemmis axillaribus rami annotini evolutae foliis 2–3 suffultae solitariae; pedunculi et pedicelli glabri; bracteae filiformes, minimae, deciduae; pedicelli 4–5 mm. longi; calycis margo edentatus vel 5-dentatus; petala viridia; styli bifidi.

HONDO: Hikami, prov. Suwo, *J. Nikai*, nos. 395, 853; Mt. Hiei, prov. Omi, *I. Sono.*

KYUSHU: Nasugoe, prov. Higo, *Z. Tashiro.*

Acanthopanax kiusianum Nakai, sp. nov.

Frutex glaber; rami sordide fuscescentes; aculei rigidi, recti, sub folio solitarii. Folia turionum brevipetiolata sed fasciculata longe petiolata; petioli glabri, 1.5–6.0 cm. longi, graciles sed recti interdum circa apicem infra 1-aculeati; foliola digitatim 5, terminalia maxima, omnia basi cuneata, obovata, apice mucronata, supra medium incurvato-serrulata, 10–37 mm. longa, 5–16 mm. lata, basi rufo-pilosa, supra viridia venis impressis, infra pallida venis elevatis. Pedunculi 4.5–5.0 cm. longi, recti, graciles, glabri; bracteae caducae, minimae, apice ciliolatae. Pedicelli 4–5 mm. longi, glabri; calycis tubus ovatus, lobi ovato-acuti, lucidi; petala viridia, oblongo-ovata, apice unguiculata, 1.5 mm. longa; stamina in nostris speciminibus

brevissima abortiva, ita nostra planta feminea; discus leviter elongatus; styli tantum basi coaliti, recurvi; stigmata papillosa elongata.

KYUSHU: Kajiki, prov. Osumi, *Z. Tashiro;* Mt. Kirishima, alt. 100–1000 m., *Z. Tashiro.*

Acanthopanax koreanum Nakai, sp. nov.

Acanthopanax spinosum Nakai, Veg. Isl. Quelp. 68, no. 947 (1914); non Miquel.

Frutex; rami caespitosi, arcuato-diffusi, sub folio recurvo-aculeati. Folia longe petiolata, fasciculatim 2–3; foliola 5, subsessilia vel brevipetiolulata, basi albo-barbata, late obovata, acuta vel acuminata, supra lucida, infra pallida venis elevatis in axillis venarum primarium barbata. Umbella longipes pedunculo 2–5 cm. longo, multiflora glabra; calycis margo obscure 5-dentatus; petala viridia reflexa, 3 mm. longa; antherae flavae oblongae. Bacca nigra, 7 mm. longa, compresso-sphaerica, apice stylis persistentibus coronata.

KOREA: Quelpaert; Ibi, *T. Nakai,* no. 6358; Hongno, *T. Nakai,* no. 158; insula Piyanto, *T. Nakai;* in Hallai-san, alt. 300 m., *T. Ishidoya.* no. 210; Hongno, *U. Faurie,* no. 893, *E. Taquet,* no. 2916; in silvis, *E. Taquet,* no. 2917; in dumosis, *U. Faurie,* no. 1666; in pago Polmongi, *E. Taquet,* no. 2915.

Acanthopanax spinosum Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 10 (1863), pro parte.—Seemann in Jour. Bot. v. 238 (1867).—Franchet & Savatier, Enum. Pl. Jap. I. 193 (1875).—Marchal in Bull. Soc. Bot. Belg. xx. 89 (1881), pro parte.—Dippel, Handb. Laubholzk. III. 237 (1893).—Koehne, Deutsch. Dendrol. 433 (1893), pro parte.—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 237 (1894); in Mitt. Deutsch. Dendr. Ges. XXVII. 23 (1918), pro parte.—Schneider, Ill. Handb. II. 427, f. 290 f–g (1909).—Rehder in Bailey, Stand. Cycl. Hort. I. 193 (1914).

Panax spinosum Linnaeus fil., Suppl. 441 (1781).

Aralia pentaphylla Thunberg, Fl. Jap. 128 (1784).—Persoon, Syn. Pl. I. 331 (1805).—Sprengel, Syst. Veg. I. 951 (1825).—Lavallée, Arb. Segrez. 125 (1879).

Aralia ? pentaphylla De Candolle, Prodr. IV. 259 (1830).—G. Don, Gen. Syst. III. 389 (1834).

HONDO: Nikko, *J. Matsumura, J. G. Jack,* Fukushima, prov. Shinano, *H. Sakurai;* Mt. Hira, prov. Omi, *I. Sono;* Mt. Togakushi, prov. Shinano, *J. Matsumura;* Adatarayama, prov. Iwashiro, *K. Nemoto;* Megura near Tokyo, *S. Okubo;* Miyanoshita, prov. Sagami, *C. S. Sargent;* Akabane, prov. Musashi, *H. Sakurai;* Mt. Hagurosan, prov. Sado, *J. Matsumura;* Mt. Ibukiyama, prov. Omi, *J. Nikai,* no. 1980; Otakegawa, prov. Shinano, *E. H. Wilson,* no. 6982bis; Nambu, *Tschonoski;* Simoda, prov. Idzu, *C. Wright.*

Acanthopanax spinosum does not occur in China; what has been considered to be that species represents the following two distinct species.

1. **Acanthopanax Hondae** Matsuda in Tokyo Bot. Mag. XXXI. 333 (1917).

Differt ab *Acanthopanace koreano* quo valde affine, umbellis breviradiatis, floribus minoribus, foliis grossius serrulatis. Hoc etiam *Acanthopanacem villosulum* accedit sed foliis subtus non villosis disco viride exquo distinctum.

Acanthopanax Hondae var. **inerme** Nakai, comb. nov.

Acanthopanax spinosum f. *inerme* Matsuda in Tokyo Bot. Mag. XXVI. 281 (1912).

Frutex; caulis arcuatus, cinereus, inermis. Petioli foliorum turionum 3–5 cm. longi, ramulorum brevium 1–4 cm. longi, supra anguste canaliculati, apice cum foliolis articulati ubi villosuli; foliola digitatim 5, media longiora 1.5–5.0 cm. longa, supra glabra costis conspicuis, infra pallida in axillis venarum secundarium rufo-ciliata, margine minute subduplicato-spinuloso-serrulata, late oblanceolata vel oblanceolata, basi cuneata; pedunculi 2.5–4.5 cm. longi, foliis breviores, glabri; pedicelli bracteis parvis setulosis suffulti, glaberrimi, 6–7 mm. longi; calycis dentes deltoidei, vix 1 mm. longi; petala reflexa; styli 2, basi connati, recurvi. Fructus maturus niger, 5–6 mm. longus.

CHINA: Siao-Hsien, Huang-Tsang-Yii, prov. Honan, *J. Hers*, no. 1052; Teng-ka-san, prov. Chekiang, *K. Honda*. Kansu, *Li-Hwang-Ping*.

Acanthopanax Hondae var. **armatum** Nakai, var. nov.

Acanthopanax spinosum Harms & Rehder in Sargent, Pl. Wilson. II. 562 (1916), pro parte.—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 23 (1918), pro parte.—Non Miquel.

Caulis sub foliis armatus.

CHINA: prov. Chekiang, Ningpo, *Chang-chi-myong;* circa Ningpo, *D. Macgregor;* in fruticetis prope oppidum Tsching-dschen, prov. Kwei-tschou, *H. Handel-Mazzetti*, no. 2044; circa Hangchow, prov. Chekiang, *F. N. Meyer*, no. 1473; Lushih, Hiung-Eul-shan, 1400 m., prov. Honan, *J. Hers*, no. 941; prov. Kiangsu, Kiangyin, *A. Allison*.

2. **Acanthopanax gracilistylum** W. W. Smith in Notes Bot. Gard. Edinb. X. 6 (1917).

Acanthopanax spinosum Hance in Jour. Bot. XVIII. 261 (1880).—Forbes & Hemsley in Jour. Linn. Soc. XXIII. 341 (1887).—Dunn & Tutcher in Kew Bull. Misc. Inform. Add. ser. X. 119 (1912).—Harms & Rehder in Sargent, Pl. Wilson. II. 562 (1916), pro parte.—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 23 (1918), pro parte.—Non Miquel.

Ab *Acanthopanace spinoso* quocum adhuc confusum est perdistinctum nam folioli inciso-serrulati, pedunculi brevissimi, umbellae pauciflorae.

CHINA: Chang-lo-hsien, Hupeh, *E. H. Wilson*, no. 1973, *A. Henry*. no. 3406A, 1224; Ichang, *A. Henry*, no. 3406; Yunnan, *A. Henry*, no. 10639, *G. Forrest;* in dumetis circa pagum Lantien inter Londi et Ksinkwa, prov. Hunan, *H. Handel-Mazzetti;* Yenan fu, prov. Shensi, *W. Purdom*, no. 350; Yu-tai-shan, prov. Honan, *J. Hers*, no. 290; circa Ningpo, prov. Chekiang, *D. Macgregor;* Huang-Tsang-Yii, prov. Kiangsu, *J. Hers*, no. 1052; Shung hsien, prov. Honan, *J. Hers*, no. 1241.

Acanthopanax commixtum Nakai, sp. nov.

Acanthopanax japonicum Matsumura, Ind. Pl. Jap. II. 2, 417 (1912); non Franchet & Savatier.

Frutex glaber, e basi caespitosus; rami arcuati, cinerei vel cinereo-fuscescentes, sub foliis subrecurve v. recte uniaculeati, lenticellis punctulatis. Petioli 1–10 cm. longi; foliola digitatim 5, rhombea v. late obovata, grosse mucronato-serrata, supra lucida. Flores polygamo-dioici; calyx breviter 5-dentatus; petala ovata, decidua, 2–2.5 mm. longa; stamina in planta feminea evoluta, petalis longiora; styli apice bifidi. Bacca nigra, 5–6 mm. longa, stylis bifidis coronata.

HONDO: Deyu, prov. Echigo, *J. Matsumura;* Aidzu, prov. Iwashiro, *R. Yatabe*, *J. Matsumura;* Nikko, prov. Shimotsuke, *J. Matsumura*, *T. Nakai;* Hakone, prov. Sagami, *R. Yatabe*.

Subsect. 3. IONOSTACHYAE Nakai.

Acanthopanax Sekt. *Euacanthopanax* Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 50 (1897), pro parte; in Mitt. Deutsch. Dendr. Ges. XXVII. 5, 18 (1918), pro parte.

Folia digitatim 5(3–4)-foliolata. Umbellae in apice ramorum hornotinorum elongatorum terminales; inflorescentia atro-purpurea; styli bifidi.

Acanthopanax trichodon Franchet & Savatier, Enum. Pl. Jap. II. 377 (1879).—Marchal in Bull. Soc. Bot. Belg. XX. 82 (1881).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 50 (1894); in Mitt. Deutsch. Dendr. Ges. XXVII. 26 (1918).—Schneider, Ill. Handb. Laubholzk. II. 427 (1909).—Matsumura, Ind. Pl. Jap. II. 417 (1912).

HONDO: Mt. Kiyozumi, prov. Awa, *S. Okubo;* Jyujyotoge, prov. Kii, *J. Matsumura;* Mt. Amagisan, prov. Idzu, *S. Okubo.*

Sect. II. CEPHALOPANAX Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 5, 14 (1918).

Folia quinata. Umbellae in apice ramorum hornotinorum elongatorum terminales umbellato-racemosae; flores brevi-pedicellati, ita umbellae subcapitatae; styli fere ad apicem connati.

Petioli crebri-aculeati. Foliola subtus saepe secus venas ciliato-aciculata simulque rufo-ciliolata.....*A. chiisanense.*
Petioli haud v. rarissime aculeati.
Folia subtus subglabra. Pedicelli brevissimi ita flores fere capitati *A. sessiliflorum.*
Folia subtus molliter pubescentia. Pedicelli plus minus elongati ita flores capitato-umbellati.....*A. divaricatum.*

Acanthopanax chiisanense Nakai, sp. nov.

Acanthopanax sessiliflorum Nakai, Veg. Isl. Quelpaert, 68, 946 (1914); Veg. Mt. Chirisan, 40, no. 341 (1915); non Seemann.

Frutex 2–3-metralis, ramosus; rami glabri inermes; cortex cinereus. Petioli 3–7 cm. longi, glabri, crebri-aculeati; foliola petiolulata, late obovata basi sensim angustata, apice cuspidata, margine argute duplicato-serrulata, supra viridia secus venas primarias minute ciliolata, subtus pallida secus venas ciliato-aciculata et rufo-pilosa. Umbellae lanatae; flores brevi-pedicellati; calyx lanatus, lobis ovatis v. ovato-acuminatis; petala ovato-oblonga, reflexa, decidua; styli 2 in unum concreti; stigmata 2. Drupa nigra, circa 6 mm. longa.

KOREA: Mt. Chiisan, *T. Nakai,* no. 369; Quelpaert, in silvis Yensil, alt. 1000 m., *E. Taquet,* no. 889, 890; in silvis, alt. 1000 m., *E. Taquet,* no. 5660.

Acanthopanax sessiliflorum Seemann in Jour. Bot. V. 239 (1867).—Marchal in Bull. Soc. Bot. Belg. XX. 84 (1881).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. 8, 50 (1894); in Mitt. Deutsch. Dendr. Ges. XXVII. 14 (1918).—Komarov in Act. Hort. Petrop. XXV. 117 (Fl. Mansh. III.) (1907).—Schneider, Ill. Handb. II. 429, fig. 292-a (1909).—Nakai, Fl. Kor. I. 275 (1909); II. 493 (1911); Veg. Diamond Mts. 180, no. 471 (1918).—Rehder in Bailey, Cycl. Am. Hort. I. 11 (1900); Stand. Cycl. Hort. I. 192 (1914).—Bean, Trees & Shrubs Brit. Isles, I. 132 (1916).

Panax sessiliflorum Ruprecht & Maximowicz in Bull. Acad. Sci. St. Pétersb. XIV. 133 (1856); 367 (1857); in Mél. Biol. II. 426 (1857); 545 (1858).—Maximowicz in Mém. Div. Sav. Acad. Sci. St. Pétersb. IX. 131 (Prim. Fl. Amur) (1859).—Regel in Mém. Acad. Sci. St. Pétersb. ser. 7, IV. no. 4, 72 (Tent. Fl. Uss.) (1861); in Gartenfl. XI. 238, t. 369 (1862).—Jäger, Ziergeh. 322 (1865).—K. Koch, Dendr. I. 675 (1869).—Franchet in Nouv. Arch. Mus. Paris, sér. 2, VI. 25 (1883); Pl. David. I. 145 (1884).—Lauche, Deutsch. Dendr. 506 (1880).—Koehne, Deutsch. Dendr. 433 (1893).—Dippel, Handb. Laubholzk. III. 234 (1893).—Beissner, Schelle & Zabel, Handb. Laubholz-Ben. 262 (1903).

Cephalopanax sessiliflorum Baillon in Adansonia, XII. 149 (1878).

KOREA: inter Keizanchin et Chosin, *E. H. Wilson*, no. 9115; Yutenji, *E. H. Wilson*, no. 10494; Tumen-Yalu divide *E. H. Wilson*, no. 9069; Suianho, *T. Uchiyama;* Genzan, *T. Nakai;* Mt. Nankanzan, *T. Uchiyama;* Myun-moun-tang, *G. Mills*, no. 444; in Mt. Kongosan, *T. Uchiyama;* Koryo, *T. Mori*, no. 35; Shin pori, *T. Nakai*, no. 5698; Kanghei, *G. Mills*, no. 700; Koyiri, *M. Furumi*, no. 480; Kashunrei, *T. Mori;* Roseidai, *T. Nakai*, no. 9641; Hoang-gui-to, *T. Nakai*, no. 2141; Nojido; *T. Nakai*, no. 2135; Gyomenpo, *T. Nakai*, no. 2134; Kamenkoko, *T. Nakai*, no. 2137.

DISTRIBUTION: also Manchuria, Amur, Ussuri and China (Chili).

Acanthopanax divaricatum Seemann in Jour. Bot. V. 239 (1867).—Franchet & Savatier, Enum. Pl. Jap. I. 195 (1875); II. 378 (1879).—Marchal in Bull. Soc. Bot. Belg. XX. 77 (1881).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 50 (1894); in Mitt. Deutsch. Dendr. Ges. XXVIII. 16 (1918).—Schneider, Ill. Handb. Laubholzk. II. 428. fig. 289 o–r (1909).—Rehder in Bailey, Stand. Cycl. Hort. I. 193 (1914).

Panax divaricatum Siebold & Zuccarini in Abh. Akad. Muench. IV. pt. II. 200 (Fl. Jap. Fam. Nat. I. 92) (1846).

Kalopanax divaricatum Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 17 (1863).—Matsumura, Ind. Pl. Jap. II. 2, 420 (1912).

Acanthopanax asperatum Franchet & Savatier, Enum. Pl. Jap. I. 193 (1875), "A. asperata;" II. 378 (1879).—Bretschneider, Hist. Europ. Bot. Discov. Chin. 863 (1898).

YESO: Sapporo, prov. Ishikari, *Y. Tokubuchi;* Junsai numa, *U. Faurie*, no. 5497; Muroran, prov. Iburi, *U. Faurie*, no. 6233; Hakodate, prov. Oshima, *C. J. Maximowicz;* ibidem, *Albrecht*.

HONDO: Nikko, prov. Shimotsuke, *K. Sawada;* Mt. Iwakisan, prov. Mutsu, *J. Matsumura;* Mt. Yatsugatake, prov. Shinano, *E. H. Wilson*, no. 7545; Chuzenji, prov. Shimotsuke, *J. Matsumura;* Agematsu, prov. Shinano, *C. S. Sargent;* Yumoto, prov. Shimotsuke, *C. S. Sargent;* Mt. Ontake, prov. Shinano, *Y. Yabe, G. Koidzumi;* Mt. Togakushi, prov. Shinano, *J. Matsumura, H. Sakurai;* Mt. Iwakisan, prov. Mutsu, *H. Sakurai;* Izunasan, prov. Shinano, *H. Sakurai*.

SHIKOKU: Kamomyomura, prov. Awa, *J. Nikai*, no. 1317.

KYUSHU: Hososhima, prov. Hiuga, *R. Yatabe, J. Matsumura;* Tsuno, prov. Hiuga, *K. Saida;* Mominokimura, prov. Higo, *Z. Tashiro;* Tano, prov. Bungo, *Z. Tashiro*.

Acanthopanax divaricatum var. **inerme** Nakai, var. nov.

Caulis et folia inermia.

KYUSHU: Mt. Homanzan, prov. Chikuzen, *Y. Nabeshi.*

Sect. III. SCIADOPHYLLOIDES Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 30 (1918).

Arborea inermis. Folia digitatim 5-foliolata. Umbellae corymboso-paniculatae, ramis reflexis; styli in unum connati; stigmata biloba.

Acanthopanax sciadophylloides Franchet & Savatier, Enum. Pl. Jap. I. 195 (1875); II. 378 (1879).—Marchal in Bull. Soc. Bot. Belg. XX. 82 (1881).—Schneider, Ill. Handb. Laubholzk. II. 429, fig. 289 s–u (1909).

Kalopanax sciadophylloides Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 51 (1894).—Matsumura, Ind. Pl. Jap. II. 2, 420 (1912).

YESO: Sapporo, prov. Ishikari, *C. S. Sargent, Y. Tokubuchi;* Jyozankei, prov. Ishikari, *J. Matsumura;* Moiwa, prov. Ishikari, *T. Nakai;* Noboribetsu, prov. Iburi (*coll.* ?), Hakodate, prov. Osima, *C. J. Maximowicz;* ibidem, *Albrecht.*

HONDO: in silvis montis Hirosaki, prov. Mutsu, *U. Faurie,* no. 6232; Nikko, prov. Shimotsuke, *C. S. Sargent, K. Sawada;* Chuzenji, prov. Shimotsuke, *J. G. Jack;* Amihari, prov. Rikuchu, *H. Sakurai;* Mt., Tsubakuradake, prov. Shinano, *E. H. Wilson,* no. 7480; near Aomori, prov. Mutsu, *C. S. Sargent;* Azumasan, prov. Iwashiro, *E. H. Wilson,* no. 7194; near Kamado, *C. S. Sargent;* in montibus Sendai, *U. Faurie,* no. 5498; in Mt. Hakkodasan, prov. Mutsu, *H. Koidzumi;* in Mt. Hakusan, prov. Kaga, *R. Yatabe, J. Matsumura;* in monte Iidesan, prov. Iwashiro, *R. Yatabe;* in monte Tateyama, prov. Etchu, *J. Matsumura;* in monte Togakushi, prov. Shinano, *J. Matsumura, H. Sakurai;* Ose, prov. Kodzuke, *B. Hayata;* in monte Komagatake, prov. Shinano, *J. Matsumura;* in monte Komagatake, prov. Echigo, *B. Hayata;* in monte Yenasan, prov. Mino, *H. Sakurai;* Shikayu, prov. Mutsu, *H. Sakurai;* Miharu, prov. Iwaki, *K. Nemoto;* in monte Ontake, prov. Shinano, *G. Koidzumi;* Narutaki, prov. Suwo, *J. Nikai,* no. 736.

SHIKOKU: in monte Yahadzusan, prov. Tosa, *K. Watanabe;* Kurofujikawa, prov. Iyo, *K. Watanabe,* Nakatsuyama, prov. Iyo, *K. Watanabe,*

KYUSHU: Iwadake, prov. Buzen, *R. Yatabe;* Kujyuzan, prov. Bungo, *Z. Tashiro.*

Evodiopanax Nakai

Evodiopanax Nakai, gen. nov.

Kalopanax Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 17 (1863), pro parte.

Acanthopanax Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 49 (1897), pro parte.

Acanthopanax sekt. *Evodiopanax* Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 28 (1918).

Generi Acanthopanaci affine sed calyce sine limbo et pyrenis dorso rotundatis et lateribus non sulcatis ita ambitu hemisphaericis distinctum.

Arbores inermes ramosae glabrae. Folia 1–3 (vulgo 3)-foliolata foliolis minute ciliato-serrulatis. Inflorescentia in apice rami abbreviati terminalis corymboso-paniculata, glabra; flores umbellati, bracteae et bracteolae

minimae v. nullae; pedicelli inarticulati; calycis limbus nullus; petala 5, aestivatione valvata, sub anthesin reflexa, decidua; stamina 5, erecto-patentia; connectivum parvum; discus depresso-hemisphaericus; styli 2, basi coaliti persistentes; ovarium 2-loculare, Bacca nigra, 2-pyrena; pyrenae dorso rotundatae non sulcatae ventre planae; albumen aequabile.—Species 2 in Japonia et China indigenae.

Evodiopanax innovans Nakai, comb. nov.

Panax innovans Siebold & Zuccarini in Abh. Akad. Muench. IV. pt. II. 198 (Fl. Jap. Fam. Nat. I. 90) (1845).

Kalopanax innovans Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 17 (1863).—Matsumura, Ind. Pl. Jap. I. 2, 420 (1912).

Acanthopanax innovans Franchet & Savatier, Enum. Pl. Jap. I. 193 (1875).—Harms in Nat. Pflanzenfam. III. abt. 8, 49 (1894); in Notizbl. Bot. Gart. Mus. Berlin, VII. 65, 248 (1917); in Mitt. Deutsch. Dendr. Ges. XXVII. 28 (1918).—Schneider, Ill. Handb. II. 427 (1909).—Rehder in Bailey, Stand. Cycl. Hort. I. 193 (1914).

YESO: Hakodate, prov. Oshima, *C. J. Maximowicz.*

HONDO: in monte Ontake, prov. Shinano, *G. Koidzumi;* Otakegawa, prov. Shinano, *E. H. Wilson,* no. 6998; Mitake, prov. Kai, *C. S. Sargent,* Chuzenji, prov. Shimotsuke, *N. Mochidzuki;* Nikko, prov. Shimotsuke, *H. Sakurai;* in monte Adzuma-san, prov. Iwashiro, *G. Nakahara;* in monte Enasan, prov. Mino, *H. Sakurai;* in monte Koyasan, prov. Kii, *U. Faurie,* no. 90; Gojyo, prov. Yamato, *J. Matsumura;* Ikedamura, prov. Bitchu. *Z. Yoshino;* Ishiyama, prov. Omi, *I. Sono;* Ouchimura, prov. Suwo, *J. Nikai,* no. 737.

SHIKOKU: Nanokawa, prov. Tosa, *K. Watanabe.*

KYUSHU: Iwatake, prov. Buzen, *R. Yatabe, J. Matsumura;* Shakaindake, prov. Higo, *Z. Tashiro;* Kirishima yama, prov. Osumi, *Z. Tashiro.*

TSUSHIMA: in monte Sumo-shiratake, T. Nakai.

This is a valuable economic tree. Its wood is white and is superior to that of Populus for straw braid used in making hats.

The following Chinese species belongs to this genus:

Evodiopanax evodiaefolium Nakai, comb. nov.

Acanthopanax evodiaefolius Franchet in Jour. de Bot. X. 306 (1896).—Harms & Rehder in Sargent, Pl. Wilson. II. 563 (1916).—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 29 (1918).

Differt ab *E. innovante* quo arcte affine ramulis non rubescentibus sed sordide cinereis.

CHINA: Mo-Tao-tsin, prov. Yunnan, *Siméon Ten,* no. 468, 508; Yunnan, *G. Forrest,* nos. 8887, 10235; Kuling, prov. Kiangsi, *L. H. Bailey;* W. Hupeh, *E. H. Wilson,* no. 1142; Wen-chuan-hsien, *E. H. Wilson,* no. 4204; in silvis prope Molien, prov. Szechuan, *C. Schneider,* no. 1427.

Evodiopanax evodiaefolium var. **ferrugineum** Nakai, comb. nov.

Acanthopanax evodiaefolius var. *ferrugineus* W. W. Smith in Notes Bot. Gard. Edinb. X. 6 (1917).

Folia subtus secus costam et inflorescentiae ferrugineo-pilosa.

CHINA: Shweli-Saboeen, prov. Yunnan, *G. Forrest,* no. 12068.

The *Acanthopanax evodiaefolius* var. *gracilis* W. W. Smith (l. c.) does not belong to this genus for it has 5 styles and 5-celled ovaries and the leaflets are always 5.

Eleutherococcus Maxim.

Eleutherococcus Maximowicz in Mém. Div. Sav. Acad. Sci. St. Pétersb. IX. 132 (Prim. Fl. Amur.) (1859), sensu ampl.—Bentham & Hooker, Gen. Pl. I. 941 (1867).—Seemann in Jour. Bot. VI. 161 (1867).—K. Koch, Dendr. I. 676 (1869).

Acanthopanax Seemann in Jour. Bot. V. 238 (1867), pro parte.—Dippel, Handb. Laubholzk. III. 235 (1893), pro parte.—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 49 (1897), pro parte.—Schneider, Ill. Handb. II. 424 (1909), pro parte.

Acanthopanax Sect. *Eleutherococcus* Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 49 (1897); in Mitt. Deutsch. Dendr. Ges. XXVII. 7 (1918).

Acanthopanax Sect. *Euacanthopanax* Harms l. c. (1897), pro parte; l. c. 18 (1918), excl. D. E.

Frutex aculeatus ramosus. Folia digitatim 3–5 foliolata. Umbellae solitariae vel umbellatae; flores cum pedicello inarticulati; calyx obsolete 5-dentatus; petala 5 aestivatione valvata; stamina 5; styli 5 (3–4) toto connati vel apice liberi; stigmata 5 (3–4); discus elevatus; drupa 5-pyrena; pyrenae compressae non sulcatae; albumen aequabile.

Species 13 in Japonia, Korea, Manshuria, Amur, China et Himalaya indigene.

The cohesion of the styles varies specifically but it is of no value in the classification of sections. The characters distinguishing Eleutherococcus from Acanthopanax are neither the cohesiveness of styles nor the presence of articulation in the flowers. No species of Acanthopanax or Eleutherococcus has real articulation at the base of the calyx. The seeming articulation appears in the dried specimens by the contraction of tissues at the base of the calyx. That portion of calyx differs in texture from the apices of the pedicels. The apices of pedicels have hard vascular bundles and do not shrink as much when dried as does the base of the calyx which consists of soft parenchyma. This non-uniform shrinking causes a false articulation. Nearly all of the species belonging to genera other than the Aralia group have with few exceptions inarticulated flowers. Eleutherococcus differs from Acanthopanax by the number of styles and number of cells in the ovary as well as in the shape of pyrenae. In Acanthopanax the number of styles and the cells of ovary is 2, rarely 3. The number of styles and cells of ovary in Eleutherococcus is 5, sometimes 3 to 6. The pyrenae of Acanthopanax are flat or slightly roundish on their ventral side, but those of Eleutherococcus are acute or acutish. I therefore remove all the species of Acanthopanax having 5-celled ovaries and place them under Eleutherococcus. These are *E. pentaphyllum*, *E. Giraldii*, *E. Rehderianum*, *E. cissifolium*, *E. stenophyllum* and *E. Wilsonii*.

Eleutherococcus senticosus Maximowicz in Mém. Div. Sav. Acad. Sci. St. Pétersb. IX. 132 (Prim. Fl. Amur.) (1859).—Regel in Gartenfl. XII. 84, t. 393 (1863).—Seemann in Jour. Bot. VI. 162 (1868).—Fr. Schmidt in Mém. Acad. Sci. St. Pétersb. ser. 7, XII. no. II. 47, 179 (Fl. Amgunoburej.); l. c. 140, no. 198 (Fl. Sachal.) (1868).—Lauche, Deutsch. Dendr.

507, f. 205 (1880).—Jäger & Beissner, Ziergeh. ed. 2, 146 (1884).—Forbes & Hemsley in Jour. Linn. Soc. XXIII. 382 (1888).—Dippel, Handb. Laubholzk. III. 235, f. 127 (1893).—Koehne, Deutsch. Dendr. 432 (1893).—Rehder in Bailey, Cycl. Am. Hort. I. 528 (1901).—Komarov in Act. Hort. Petrop. XXV. 119 (Fl. Mansh.) (1907).—Nakai, Veg. Diamond Mts. 180 (1918); in Tokyo Bot. Mag. XXVI. 5 (1912).

Hedera senticosa Maximowicz in Bull. Acad. Sci. St. Pétersb. XV. 134 (1856); 367 (1857); in Mél. Biol. II. 426 (1857); 546 (1858).

Acanthopanax senticosus Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 50 (1894); in Mitt. Deutsch. Dendr. Ges. XXVII. 5, 6 (1918).—Rehder in Bailey, Stand. Cycl. I. 193 (1914).—Bean, Trees Shrubs Brit. Isles, I. 171 (1916).

Acanthopanax Eleutherococcus Makino in Tokyo Bot. Mag. XII. 19, in nota sub *Acanthopanace hypoleuco* (1898).

YESO: inter Tokoro et Abashiri, *M. Shirai;* Rubeshibe, prov. Kitami, *E. H. Wilson*, no. 7393.

SAGHALIN: Toyohara, *E. H. Wilson*, no. 7330; in silvis Korsakof, *U. Faurie*, no. 396, 397; in silvis Wladimiroff, *U. Faurie*, no. 37; sine loco speciali, *Augustinowicz*.

KOREA: Koseimen, *T. Nakai*, no. 2136; Kokai, *E. H. Wilson*, no. 10588; Sempo, *E. H. Wilson*, no. 8826; Gyosohyo to Engan, *E. H. Wilson*, no. 8944; Kongosan, no. 434; Kashunrei, *T. Mori;* Juhochin to Kokai; *T. Nakai*, no. 2138; Vallis Czen-dshin-gan, *Komarov*, no. 1149; in monte Hiraiho, *T. Nakai*.

Eleutherococcus senticosus f. subinermis Regel, Mém. Acad. Sci. St. Pétersb. sér. 7, IV. no. 4, 73 (Tent. Fl. Uss.) (1861).

Eleutherococcus senticosus f. *inermis* Komarov in Act. Hort. Petrop. XXV. 121 (Fl. Mansh. III.) (1907).

Acanthopanax senticosus f. *inermis* Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 8 (1918).

Caulis et petiolo inermes v. aculeis raris adspersi.

Distribution: Amur, Manshuria and China (Chili).

Eleutherococcus hypoleucus Nakai, comb. nov.

Acanthopanax hypoleucum Makino in Tokyo Bot. Mag. XII. 18 (1898).—Matsumura, Ind. Pl. Jap. II. 417 (1912).—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 8 (1918).

Eleutherococcus japonicus Makino, l. c. 19. (1898), pro syn. *Acanthopanacis hypoleuci*.

Acanthopanax Fauriei Harms in Notizbl. Bot. Gart. Mus. Berlin, XII. 248 (1917); in Mitt. Deutsch. Dendr. Ges. XXVII. 9 (1918).

HONDO: in monte Norikuradake, prov. Shinano, *U. Faurie*, no. 6841; Misayama, prov. Shinano, *K. Onuma, H. Sakurai*.

SHIKOKU: in monte Kuratakiyana, prov. Tosa, *K. Watanabe;* in monte Torigatayama, prov. Tosa, *K. Watanabe*.

Eleutherococcus japonicus Nakai, comb. nov.

Aralia pentaphylla Siebold & Zuccarini in Abh. Muench. Akad. IV. pt. II. 201 (Fl. Jap. Fam. Nat. I. 93) (1845), excl. syn. *Panax spinosa;* non Thunberg.

Acanthopanax spinosum Miquel in Ann. Mus. Lugd.-Bat. I. 10 (1863), excl. syn. *Panax spinosum*.—Dippel, Handb. Laubholzk. III. 237 (1893).—Zabel in Gartenfl. XXX. 336 (1881).—Non *Panax spinosum* L.

Acanthopanax japonicum Franchet & Savatier, Enum. Pl. Jap. II. 377 (1879).
Acanthopanax pentaphyllum Marchal in Bull. Soc. Bot. Belg. XX. 79 (1881).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 50 (1897); in Mitt. Deutsch. Dendr. Ges. XXVII. 21 (1918).—Rehder in Bailey, Cycl. Am. Hort. I. 11 (1900); in Bailey, Stand. Cycl. Hort. I. 193, f. 82 (1914).—Bean, Trees & Shrubs Brit. Isles, I. 131 (1914).
Acanthopanax trichodon Zabel in Gartenwelt, XI. 535 (1909); non Franchet & Savatier.
Eleutherococcus pentaphyllus Nakai, Chosenshokubutsu I. 420 (1914).

YESO: Hakodate, prov. Oshima, *J. Matsumura;* ibidem, *C. J. Maximowicz;* ibidem, *Albrecht;* Otaru, prov. Ishikari, *K. Saida;* Shiriuchi, prov. Oshima, *K. Miyabe* et *Y. Tokubuchi*; Sapporo, prov. Ishikari, *S. Arimoto.*

HONDO: Tokyo, *T. Makino;* Shinobuyama, prov. Iwashiro, *K. Nemoto;* Otakeyama, prov. Shinano, *E. H. Wilson*, no. 6982; Nambu, *Tschnooski.*

Eleutherococcus japonicus f. variegatus Nakai, comb. nov.
Acanthopanax pentaphyllum var. *variegatum* Hort. apud Rehder in Bailey, Cycl. Am. Hort. I. 11 (1900); in Bailey, Stand. Cycl. Hort. I. 193 (1914).—Bean, Trees & Shrubs Brit. Isles, I. 131 (1916).

In hortis cultus.

Kalopanax Miq.

Kalopanax Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 16 (1863), pro parte.—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 50 (1897), pro parte.
Brassaiopsis Seemann in Jour. Bot. II. 290 (1864), pro parte; non Decaisne & Planchon.
Acanthopanax Bentham & Hooker, Gen. Pl. I. 938 (1867), pro parte; non Miquel.

Miquel's Kalopanax includes species belonging to four distinct genera. His *Kalopanax ricinifolium* is to be considered the type of this genus; his *K. sumatranum* and *K. resectum* belong to the genus Brassaiopsis; his *K. divaricatum* to the genus Acanthopanax, and his *K. innovans* to our new genus Evodiopanax.

Kalopanax ricinifolium Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 16 (1863).—Fr. Schmidt in Mém. Acad. Sci. St. Pétersb. ser. 7, XII. no. II. 140 (Fl. Sachal.) (1868).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 51 (1894).—Palibin in Act. Hort. Petrop. XVII. 99 (Consp. Fl. Kor. I.) (1898).—Komarov in Act. Hort. Petrop. XXV. 122 (Fl. Mansh. III.) (1907).—Nakai, Fl. Kor. I. 275 (1909); II. 493 (1911).—Matsumura, Ind. Pl. Jap. II. 420 (1912), pro parte.
Panax ricinifolium Siebold & Zuccarini in Abh. Akad. Muench. IV. pt. II. 199 (Fl. Jap. Fam. Nat. I. 91) (1845).
Brassaiopsis ricinifolia Seemann in Jour. Bot. II. 291 (1864).
Acanthopanax ricinifolium Seemann in Jour. Bot. VI. 140 (1868); Revis. Heder. 86 (1868).—Marchal in Bull. Soc. Bot. Belg. XX. 85 (1881).—Shirasawa, Icon. Ess. For. Jap. II. t. 56, f. 11–24 (1909).—Schneider, Ill. Handb. Laubholzk. II. 429, f. 289 v–z, f. 291 b–c (1909).—Rehder in Bailey, Cycl. Am. Hort. I. 11 (1900); in Bailey, Stand. Cycl. Hort. I. 192, f. 80 (1914).—Bean, Trees & Shrubs Brit. Isles, I. 131 (1916).—Koehne in Mitt. Deutsch. Dendr. Ges. XXII. 145 (1913).
Acanthopanax ricinifolia Franchet & Savatier, Enum. Pl. Jap. I. 193 (1875).
Acanthopanax ricinifolius v. *Maximowiczii* Koehne in Mitt. Deutsch. Dendr. Ges. XXII. 148 (1913), pro parte.—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 31 (1918), pro parte.

Acanthopanax ricinifolium Decaisne & Planchon apud Lavallée, Arb. Segrez. 126 (1877).—Dippel Handb. Laubholzk. III. 237 (1893).—Schelle in Mitt. Deutsch. Dendr. Ges. XVIII. 289 (1909).

Tetrapanax ricinifolium K. Koch in Wochenschr. Gärtn. Pflanzenk. II. 371 (1859).

Kalopanax ricinifolium α. **typicum** Nakai.

MANSHURIA: Deaus Dundas, *C. J. Maximowicz.*

KOREA: Jin sen, *T. Uchiyama;* Peuk-tung-dsi, *T. Uchiyama;* Chinnampo, *H. Imai*, no. 117; Koryo, *T. Mori*, no. 31; insula Sajito, *T. Nakai*, no. 9750; Peninsula Kagen, *T. Nakai*, no. 9749; in monte Keiryusan, *T. Nakai*, no. 8106; Seoul, *N. Okada;* in montibus Kongosan, *T. Nakai*, no. 5695; in monte Jyuseizan, *T. Nakai*, no. 2139; insula Hoto, *Y. Hanabusa*; via inter Chuczan et Czaschien, *V. Komarov*, no. 1150; in insula Daikokuzanto, *T. Ishidoya & Chung*, no. 3635; Taiyudo, *E. H. Wilson*, no. 8613; Peuk-han-san, *Sontag;* Gensen, *C. S. Sargent;* in monte Kongosan, *E. H. Wilson*, no. 9242; Chemulpo, *E. H. Wilson*, no. 10554; in monte Hakusan, prov. Keiki, *E. H. Wilson*, no. 10615; Chinnampo. *J. G. Jack*, ibidem, *U. Faurie*, no. 546; in collibus Ouensan, *U. Faurie*, no. 210; Hansan Monastery, *Mills*, no. 340; Genzan, *T. Nakai;* insula Okto, *T. Nakai*, no. 299; Kongosan, *T. Nakai*, no. 5696.

DAGELET: sine loco speciali, *K. Okamoto, E. H. Wilson*, no. 8577; Rarikol, *T. Ishidoya*, no. 103; in monte Jyoho, *T. Nakai.*

QUELPAERT: in monte Hallasan, *T. Nakai*, no. 63, 6362; in silvis, *E. Taquet*, no. 137; Hallaisan, *T. Ishidoya*, near Mushroom House, *E. H. Wilson*, no. 9471.

YESO: Hakodate, prov. Oshima, *Albrecht.*

HONDO: in monte Amagisan, prov. Idzu, *J. Matsumura;* Aidzu, *R. Yatabe* & *J. Matsumura;* in monte Togakushi, prov. Shinano, *J. Matsumura;* Konodai, prov. Shimousa, *J. Matsumura;* Omiya, prov. Musashi, (*coll.* ?); Okunimoto, prov. Uzen, (*coll.* ?).

KYUSHU: Nagasaki, prov. Hizen, *R. Oldham.*

CHINA: Tsi-Yiian Hsien, prov. Honan, *J. Hers*, no. 1779; Tien Tai, prov. Chekiang, *J. Hers*, no. 252.

Kalopanax ricinifolum var. **magnificum** Zabel in Gartenwelt, XI. 535, fig. p. 539 (1907).—Koehne in Mitt. Deutsch. Dendr. Ges. XXII. 150 (1913).—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 32, t. 5 g–o, t. 86 (1918).

Acanthopanax acerifolium Schelle in Mitt. Deutsch. Dendr. Ges. XVII. 212 (1908).

Kalopanax ricinifolium Matsumura, Ind. Pl. Jap. II. 2, 420 (1912), pro parte.

Folia subtus pilis simplicibus elongatis crispis v. multifidis plus minus lanata, ad medium late 5–7-fida.

YESO: sine loco speciali, *L. Boehmer;* Horoidzumi, prov. Hidaka, *Y. Tokubuchi;* Nanai, *C. S. Sargent;* Sapporo, *J. G. Jack*, ibidem, *S. Arimoto.*

HONDO: in monte Tsukuba, prov. Hitachi, *H. Sakurai;* Nikko, prov. Shimotsuke, *J. Matsumura;* in monte Ontake, prov. Shinano, *J. Matsumura;* in monte Komagatake, prov. Shinano, *R. Yatabe & J. Matsumura;*

Yumoto, prov. Shimotsuke, *E. H. Wilson*, no. 6760; Nasu, prov. Shimotsuke, *H. Sakurai;* Kakidao, prov. Suwo, *J. Nikai*, no. 730.

KOREA: Koryo, *T. Nakai.*

CHINA: prope Chang-hua, prov. Chekiang, *F. N. Meyer*, no. 1556.

Kalopanax ricinifolium var. **Maximowiczii** Nakai, comb. nov.

Aralia Maximowiczii Van Houtte in Fl. des Serr. xx. 39, t. 2067–2068 (1874).

Acanthopanax ricinifolius var. *Maximowiczii* Schneider, Ill. Handb. Laubholzk. II. 429, fig. 291 d (1909).—Beissner in Mitt. Deutsch. Dendr. Ges. XVIII. 290 (1909).—Koehne in Mitt. Deutsch. Dendr. Ges. XXII. 149 (1913), pro parte.—Bean, Trees & Shrubs Brit. Isles, 131 (1916).—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 31, t. 5, fig. e, f, t. 7, 8 (1918), pro parte.

Folia ramorum floriferorum anguste profunde laciniata, subtus plus minus canescentia.

YESO: sine loco speciali, *R. Yatabe.*

HONDO: Fukushima, prov. Shinano, *C. S. Sargent;* monte Ontake, prov. Shinano, *G. Koidzumi;* monte Togakushi, prov. Shinano, *H. Sakurai.*

CHINA: prov. Honan, *J. Hers*, no. 29.

Kalopanax ricinifolium var. **lutchuense** Nakai, var. nov.

Folia glabra, omnia 9-costata lobis ovato-attenuatis.

LIUKIU: insula Okinawa, *Y. Tashiro, J. Matsumura, T. Miyagi.*

Kalopanax ricinifolium var. **chinense** Nakai, var. nov.

Acanthopanax ricinifolium Harms & Rehder in Sargent, Pl. Wilson. II. 559 (1916).—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. t. 5, fig. A–D (1918).

Folia breviter lobata. Inflorescentia minus decomposita.

CHINA: Hupeh occid., *E. H. Wilson*, no. 602; Hsing-shan Hsien, prov. Hupeh, *E. H. Wilson*, no. 602; prope Washan, *E. H. Wilson*, no. 1962; Ichang, *E. H. Wilson*, no. 1963; Fupe, *C. Silvestri;* Yunnan, *G. Forrest*, no. 11505, 11256; in silva infra vicum Tungdjiapai prope minas Hsikwangshan, prov. Hunan, *H. Handel-Mazzetti*, no. 2020; prope Langtai Ting, prov. Kweichau, *C. Schoch*, no. 408; Ningpo Mts., *E. Faber*, no. 44.

Koehne made a thorough study of this species from plants cultivated in Germany and published the results in Mitteilungen der Deutschen Dendrologischen Gesellschaft no. 22 (1913). He stated that there are three distinct forms: 1) those having leaves shallowly cleft remaining unchanged through the age of the tree; 2) those having leaves deeply and narrowly cleft when young but shallowly cleft when old; 3) those having leaves shallowly cleft when young but deeply and narrowly cleft when old. As Siebold's specimens kept in the herbarium of the university of Leyden have the leaves lobed in various forms he took var. *Maximowiczii* Schneider as the name for his second and third group, and var. *magnificum* Zabel for his first group. His classification is principally based upon the plants cultivated in Germany and he paid no attention to the pubescence of leaves which is a marked characteristic of the species. There are many intermediate forms in Japan and it is hard to draw any definite distinctions.

1. Leaves always shallowly lobed and sparsely hairy.

2. Leaves sparsely hairy when mature, deeply lobed on young but shallowly lobed on mature trees.

3. Leaves always shallowly lobed and densely hairy.

4. Leaves always deeply lobed and densely hairy.

5. Leaves shallowly lobed and sparsely hairy on young, deeply lobed and densely hairy on mature trees.

By Siebold (Florae Japonicae Familiae naturales, n. 410 [1846]) the species was described as with "foliis alternis longe petiolatis e basi subcordata vel truncata orbicularibus profunde palmato-quinquefidis, lobis oblongis acuminatis argute serratis glabris coriaceis," and further in the detailed notes below he makes the following statement: "lamina basi subcordata, rotundata vel truncata, orbicularia, ad medium circiter usque palmato-quinqueloba lobis oblongis acuminatis lateralibus parum brevioribus, utrinque glabra subtus dense reticulato-venosa."

Thus we readily see that our first and second groups correspond to Siebold's *Panax ricinifolium*, though the specimens at Leyden show a variety of forms. Our first and second groups should therefore be named var. *typicum*. The third is *Acanthopanax ricinifolium* var. *magnificum* or *Acanthopanax acerifolium* Schelle. The fourth and the fifth are *Aralia Maximowiczii* Van Houtte. The first group is found in Hondo; the second is distributed through Hondo, Korea, Quelpaert, Manchuria, Ussuri and China; the third is distributed in Yeso, Hondo, Korea and China; the fourth and fifth are in Yeso, Hondo and China. Koehne says, "Blühende Zweige mit tief geteilten Blättern sind noch nicht bekannt geworden" thus flowers of var. *Maximowiczii* have not been seen in Germany. But we have a flowering specimen of the variety collected in the province of Shinano and I myself have seen the same type not rarely in the mountains of the province of Kai. Therefore this should be the type of a distinct variety. In the Arnold Arboretum there is growing a tree of this variety which was introduced from France. It is now of good size but has not yet flowered. There are also in this Arboretum three large trees of this species raised from seed collected by Professor Sargent in Yeso. They correspond to our third type. Another tree raised from seed collected by Mr. J. G. Jack in Yeso in 1905 is also of the third type, yet it is less hairy.

The Liukiu type which is just like the figure a of Koehne and as Tafel 5, fig. A of Harms has leaves whose main ribs approximately radiate from the base of the leaves, but the leaves are always 9-lobed. In general the leaves of the flowering branches of this species are 5–7 ribbed. The Chinese plants which have very short lobes belong to var. *chinense*.

Echinopanax Dcne. & Planch.

Echinopanax Decaisne & Planchon in Rev. Hort., 1854, 105.—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 34 (1894).—Schneider, Ill. Handb. Laubholzk. II. 429 (1909).

Panax 2. *Oplopanax* Torrey & Gray, Fl. North America I. 648 (1840).
Horsfieldia Seemann in Jour. Bot. v. 237 (1867), non Blume.[1]
Oplopanax Miquel in Ann. Mus. Lugd.-Bat. I. 16 (1863).
Panax De Candolle, Prodr. IV. 252 (1830).—G. Don, Gen. Syst. III. 384 (1834), pro parte.
Fatsia Bentham & Hooker, Gen. Pl. I. 3, 937 (1867), pro parte.

Folia saepe peltata grosse inciso-serrata. Flores racemosi; calycis dentes subnulli ..... *E. japonicum*
Folia nunquam peltata minute serrulata. Flores stricte umbellati; calycis dentes saepe evoluti ..... *E. elatum.*

Echinopanax japonicum Nakai, sp. nov.

Oplopanax horridum Torrey & Gray apud Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 16 (1863); non *Panax horridum* Torr. & Gr.
Aralia Laribuki Keiske herb. ex Miquel, l. c. (1863), pro synon.
Aralia Faribuki Siebold herb. ex Miquel, l. c. (1863), pro synon.
Horsfieldia horrida Seemann in Jour. Bot. v. 237 (1867); Rev. Gatt. Heder. 86 (1868), quoad specimina e Japonia.
Fatsia horrida Bentham & Hooker, Gen. Pl. I. 939.—Dippel, Handb. Laubholzk. III. 238 (1893), quoad plantam Japonicam.
Fatsia horrida Franchet & Savatier, Enum. Pl. Jap. I. 194 (1875).
Echinopanax horridum Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 34 (1894); Mitt. Deutsch. Dendr. Ges. XXVII. 34 (1918), quoad plantam Japonicam.—Schneider, Ill. Handb. II. 430, fig. 291, g (1909), quoad plantam Japonicam.—Matsumura, Ind. Pl. Jap. II. 418 (1912).

Affine E. horrido sed exquo foliis grossius incisis longe acuminatis, spinis rigidioribus, inflorescentia nunquam barbata statim dignoscendum.

Frutex; caulis densissime aculeatus. Folia longe petiolata; petioli dense hispidi; lamina palmatifida, lobis inciso-laciniatis, supra viridia, ad venas aciculata, infra pilosa et ad venas aciculati, basi cordata saepe peltata. Flores racemoso-decompositi; pedunculi et pedicelli pilosi saepe aciculati; calycis lobi obsoleti; petala viridescentia. Bacca 6 mm. longa, rubra, stylis 2-fidis persistentibus coronata.

YESO: Esashi, *K. Miyabe & Y. Tokubuchi;* sine loco speciali, *L. Boehmer;* Hakodate, *C. Wright.*

HONDO: monte Iwatesan, *G. Nakahara*; monte Iwakisan, *H. Sakurai;* Nikko, *J. Matsumura;* ibidem, *H. Sakurai;* monte Bandaisan, *R. Yatabe & J. Matsumura;* monte Hakusan, *R. Yatabe & J. Matsumura;* ibidem, *J. Nikai*, no. 1981; Ibidem, *H. Sakurai;* monte Gassan, *S. Okubo;* monte Ontake, *J. Matsumura;* ibidem, *G. Koidzumi;* monte Yatsugatake, *H. Sakurai;* monte Iidesan, *K. Nemoto;* monte Hakkodasan, *U. Faurie*, no. 6235; ibidem, *E. H. Wilson*, no. 7097; Yumoto in Nikko, *E. H. Wilson*, no. 6834; Nippon media et Nambu, *Tschonoski.*

Echinopanax elatum Nakai, Fl. Kor. I. 276, t. 15 (1909); Veg. Diamond Mts. 180 (1918).

Echinopanax horridum Komarov in Act. Hort. Petrop. XXV. 119 (Fl. Mansh. III.) (1909).—Harms in Mitt. Deutsch. Dendr. Ges. XXVII. 34 (1918), pro parte.

KOREA: Hotaisan, *M. Furumi*, no. 247; monte Rorinsan, *T. Mori;* monte Chiisan, *T. Nakai;* Diamond Mts., *T. Nakai*, no. 5697, *T. Uchi*.

[1] Horsfieldia contains only *H. aculeata* Blume which has peltate leaves with dense stellate hairs and paleaceous fruits.

yama; monte Gatokurei, *T. Nakai*, no. 2140; Abuzsa-kozar, *V. Komarov*, no. 1147; Diamond Mts., *E. H. Wilson*, no. 10486; Tokujitsuri, prov. Kankyo austr., *E. H. Wilson*, no. 9152; monte Setsurei, *E. H. Wilson*, no. 9033.

Fatsia Dcne. & Planch.

Fatsia Decaisne & Planchon in Rev. Hort. 1854, 405.—Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 11 (1863).—Seemann in Jour. Bot. III. 176 (1865).—K. Koch, Dendr. I. 677 (1869).—Bentham & Hooker, Gen. Pl. I. 3, 939 (1867), pro parte.—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 33 (1894).

Aralia De Candolle, Prodr. IV. 257 (1830), pro parte.—G. Don, Gen. Syst. III. 388 (1834), pro parte.

Fatsia japonica (Thunberg) Decaisne & Planchon in Rev. Hort. 1854, 405.—Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 11 (1863).—Seemann in Jour. Bot. III. 176 (1865).—Bentham & Hooker, Gen. Pl. I. 939 (1867), pro parte.—K. Koch, Dendr. I. 677 (1869).—Franchet & Savatier, Enum. Pl. Jap. I. 194 (1875).—Lavallée, Arb. Segrez. 126 (1877).—Lauche, Deutsch. Dendr. 307, fig. 206 (1880).—Dippel, Handb. Laubholzk. III. 239 (1893).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 33 (1894).—Ito & Matsumura in Jour. Coll. Sci. Tokyo, XII. 535 (1899).—Miller in Bailey, Cycl. Am. Hort. II. 571 (1901).—Matsumura, Ind. Pl. Jap. II. 419 (1912).—Rolfe in Bot. Mag. CXLI. t. 8638 (1915).—Bean, Trees & Shrubs Brit. Isles I. 554 (1916).

Aralia japonica Thunberg, Fl. Jap. 128 (1784).—Willdenow, Spec. I. 1519 (1797).—Sprengel, Syst. Veg. I. 951 (1825).—De Candolle, Prodr. IV. 258 (1830).—G. Don, Gen. Syst. III. 389 (1834).

Aralia Sieboldii hort. ex K. Koch in Wochenschr. Gärtn. Pflanzenk. II. 407 (1859), pro synon.

HONDO: Tokyo, *T. Makino;* Misaki, prov. Sagami, *T. Nakai;* Enoshima, prov. Sagami, *T. Nakai;* Oiso, prov. Sagami, *H. Sakurai.*

KYUSHU: in insula Yakushima, *E. H. Wilson*, no. 6073; sine loco speciali, *C. Wright;* Nagasaki, *R. Oldham;* ibidem, *J. Maximowicz.*

TSUSHIMA: in rupibus Idzuhara, *T. Nakai;* ibidem, *Y. Yabe.*

LIUKIU: Kunchan insulae Okinawa, *Y. Tashiro;* in monte Ubachimata insulae Okinawa, *J. Matsumura.*

There are many garden forms which often mutate from the type and whose characters are hardly inheritable.

Fatsia japonica f. variegata.

Aralia Sieboldii variegata Veitch in Proc. Roy. Hort. Soc. I. 577 (1861).

Folia varie albo-variegata.

Fatsia japonica f. albo-marginata.

Fatsia japonica var. *albo-marginata* Lavallée, Arb. Segrez. 126 (1877), nomen nud.

Folia margine alba.

Fatsia japonica f. aureo-variegata.
Fatsia japonica var. *aureo-variegata* Lavallée l. c. (1877), nomen nud.
Folia aureo-variegata.

Fatsia japonica f. aureo-reticulata.
Fatsia japonica var. *aureo-reticulata* Verschaffelt apud André in Ill. Hort. XVII. 116, t. 22 (1870).—Lavallée, Arb. Segrez. 126 (1877).
Aralia japonica variegata Mouillefert, Arb. Arbriss. II. 879 (1896).
Folia aureo-reticulata.

Fatsia japonica f. undulata.
Fatsia japonica var. *undulata* Lavallée, Arb. Segrez. 126 (1877), nomen nud.
Folia margine eximie undulata, interdum subcrispa.

Fatsia japonica f. lobulata.
Fatsia japonica var. *lobulata* Makino in Jour. Jap. Bot. I. 3, 10 (1916).
Lobi foliorum lobulati.

Boninofatsia Nakai

Boninofatsia Nakai, gen. nov.

Differt a Fatsia quacum adhuc confusa filamentis complanatis, connectivo producto, pyrenis crustaceis, albumine ruminato.

Arboreus; caulis solitarius apice ramosus. Folia exstipulata petiolata biennia palmatifida serrulata v. integra. Umbellae paniculatae, ramis et bracteis articulatis; pedicelli elongati cum floribus inarticulati; calycis lobi nulli; petala 5 aestivatione valvata; stamina 5; filamenta plana; connectivum bene evolutum apice productum. Discum plus minus evolutum; styli 5 liberi; ovarium 5-loculare; ovula in loculis solitaria; bacca nigra; pyrenae 5 crustaceae. Albumen ruminatum.—Species duae in Bonin incolae.

Pedicelli 2–3 cm. longi.....*B. oligocarpella.*
Pedicelli 1 cm. longi.....*B. Wilsonii.*

Boninofatsia oligocarpella Nakai, comb. nov.
Fatsia oligocarpella Koidzumi in Tokyo Bot. Mag. XXXII. 136 (1918).

BONIN: in monte Kuwanokiyama insulae Habajima, *S. Nishimura;* ibidem, *T. Nakai;* in silvis montis Sekimonyama insulae Hahajima, *T. Nakai;* in insula Kita-iwo, *T. Nakai.*

Boninofatsia Wilsonii Nakai, sp. nov.
Fatsia oligocarpella Wilson in Jour. Arn. Arb. I. 109 (1919); non Koidzumi.

Arborea gracilis 7–8 m. alta; rami glabri. Petioli 3–20 cm. longi, glaberrimi, teretes, basi dilatati, amplexicaules; lamina foliorum 8–19 cm. longa, 9–26 cm. lata, 3–7-lobata, glaberrima, lobis ovatis v. obovatis v. oblongis, supra lucida infra pallida et costis valde elevatis, margine integerrima sed repanda. Umbellae paniculatae. Infructescentia usque 16 cm. longa; axis albo-flosculosa; pedicelli 1 cm. longi, fere glabri; bacca 7–9 cm. longa, oblonga, nigra, stylis 5 liberis persistentibus coronata. Pyrenae crustaceae. Albumen ruminatum.

BONIN: Chichijma, in silvis, *E. H. Wilson*, no. 8250, April 22, 1917; Chichijima, *H. Otomo*, May 4, 1917.

Diplofatsia Nakai

Diplofatsia Nakai, gen. nov.

Folia exstipulata, longe petiolata, biennia, palmatifida, lobis serratis. Umbellae paniculatae rufo-barbatae; bracteae magnae, caducae, rufo-barbatae; pedicelli rufo-barbati, apice articulati; calycis lobi desunt; petala 5 valvata; stamina 5; connectivum parvum; discus convexus; ovarium 10-(8–11) loculare; styli 10 (8–11) distincti.—Species 1 in Formosa indigena.

Diplofatsia polycarpa Nakai, comb. nov.

Fatsia polycarpa Hayata in Jour. Coll. Sci. Tokyo, xxv. art. xix. 105, t. 8 (Fl. Mont. Formos.) (1908); Icon Pl. Formos. ii. 59 (1912).—Kanehira, Formos. Trees, 275 (1917).

FORMOSA: monte Morrison 2300 m., *T. Kawakami* et *U. Mori*, no. 1568; Arisan, prov. Kagi, 500–2500 m., *E. H. Wilson*, nos. 9756, 10859.

The smooth naked calyx is articulated with the rusty-haired pedicel and the tomentum being conspicuous especially at its end, the separation between the calyx and pedicel is very marked.

Tetrapanax K. Koch

Tetrapanax K. Koch in Wochenschr. Gärtn. Pflanzenk. ii. 371 (1859).—G. Bennett in Jour. Bot. ii. 309 (1864).—Seemann in Jour. Bot. vi. 57 (1868).—Harms in Engler & Prantl, Nat. Pflanzenfam. iii. abt. 8, 33 (1894).

Fatsia Bentham & Hooker, Gen. Pl. i. 939 (1867), pro parte.

Tetrapanax papyriferum K. Koch in Wochenschr. Gärtn. Pflanzenk. ii. 371 (1859).—Bennett in Jour. Bot. ii. 309 (1864).—Seemann in Jour. Bot. vi. 58 (1868), "T. papyrifera."—Harms in Engler & Prantl, Nat. Pflanzenfam. iii. 8, 34 (1894), "T. papyrifer."

Aralia ? papyrifera Hooker in Hooker's Jour. Bot. Kew Gard. Misc. iv. 53, t. 1, 2 (1852).—Planchon in Fl. des Serr. viii. 153, t. 806–807 (1853); xii. 37, t. 1201 (1857).

Aralia papyrifera Hooker in Bot. Mag. lxxxii. t. 4897 (1856).

Fatsia papyrifera Forbes & Hemsley in Jour. Linn. Soc. xxiii. 341 (1888).—Miller in Bailey, Cyclop. Am. Hort. ii. 57 (1901); in Bailey, Stand. Cyclop. Hort. 1204 (1915).—Matsumura & Hayata, Enum. Pl. Formos. 177 (1906).—Léveillé, Cat. Pl. Yunnan, 11 (1915).

LIUKIU: in page Mizato insulae Okinawa, *J. Matsumura*.

FORMOSA: Suitenryo, *B. Hayata;* Kelung, *T. Makino;* Arisan, prov. Kagi, alt. 2000 m. *E. H. Wilson;* pede montis Taihei, prov. Giran, alt. 666 m. *E. H. Wilson*, no. 10131; sine loco speciali, *R. Oldham*, no. 198.

CHINA: Yunnan, in silvis, *A. Henry*, no. 11358; Hunan, prope urbem Tschangscha, *H. Handel-Mazzetti*, no. 459; Hupeh, *A. Henry*, no. 7763.

Oreopanax Dcne. & Planch.

Oreopanax Decaisne & Planchon in Rev. Hort. 1854, 107.—Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 26 (1863).—Seemann in Jour. Bot. III. 270 (1865).—Bentham & Hooker, Gen. Pl. I. 946 (1867).—Marchal in Martius, Fl. Brasil. XI. 251 (1878).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 40 (1894).

Oreopanax formosanum Hayata in Jour. Coll. Sci. Tokyo, XXV. art. XIX. 108, pl. 14 (Fl. Mont. Formos.) (1908); Icon. Pl. Formos. II. 61 (1912).—Kanehira, Formos. Trees, 280 (1917).

FORMOSA: in monte Arisan, *G. Nakahara;* in monte Niitakayama, *T. Kawakami* et *U. Mori*, no. 1871 et 1709; in monte Arisan, *E. H. Wilson*, no. 9734.

According to S. Sasaki, collector for the Formosan Government, this plant usually grows on dry highlands from 2500–3000 m. above sea-level but sometimes as low as 2000 m. altitude, but on Mt. Daibusan of South Formosa it grows in the woods at about 1000 m. above sea-level. Its trunk attains a height of 10–12 m. and a diameter of about 35–38 cm. The bark is grayish white and has longitudinal cleavages; the pith is large. The manner of branching somewhat resembles that of *Firmiana simplex* W. F. Wight; the leaves are evergreen.

Agalma Miq.

Agalma Miquel,[1] Fl. Ned. Ind. I. 752, t. 11 (1855).—Seemann in Jour. Bot. II. 290, 296 (1864); VI. 164 (1868).

Heptapleurum Bentham & Hooker, Gen. Pl. I. 942 (1867); non Gaertner.

Heptapleurum subgen. *Agalma*, C. B. Clarke in Hooker, Fl. Brit. Ind. II. 728 (1879), forsan pro parte.

Schefflera Sect. *Agalma* Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 38 (1894).

Paratropia Bentham, Fl. Hongk. 136 (1861); non A. P. de Candolle.

Arbores pleraeque terrestres. Folia alterna, digitata, foliolis petiolulatis. Inflorescentia racemoso-decomposita; calycis tubus ovario adnatus, limbus 5–6 dentibus persistentibus; petala 5–6, ovato-oblonga, aestivatione valvata, apice incurva; stamina 5–6; styli breve v. longe columnares; ovarium 5–6-loculare; drupa stylo persistente rostrata, 5–6-angulata; pyrenae subchartaceae.—Species circiter 20 in Formosa, Liukiu, China austr., Ins. Philipp., Borneo, Cochinchina, Malaya, Java, Sumatra, India orient. et Ceylon.

Agalma taiwanianum Nakai, sp. nov.

Heptapleurum racemosum Hayata in Tokyo Bot. Mag. XX. 53 (1906); in Jour. Coll. Sci. Tokyo XXV. art. XIX, 107 (Fl. Mont. Formos.) (1908); Icon. Pl. Formos. II. 60 (1912).—Kanehira, Formos. Trees, 279 (1917).—Non Beddome.

Schefflera racemosa Matsumura, Ind. Pl. Jap. II. 2, 422 (1912), excl. syn.; non Harms.

[1] Agalma DC. is cited erroneously by Steudel (Nomencl. ed. 2, 33 [1841]) as a generic name, though De Candolle (Prodr. VII. 250 [1838]) had proposed it as a sectional name of Mulgedium.

Differt a *H. racemoso* quocum adhuc confusum foliis saepe octomeris, axi inflorescentiae elongata racemosa et ramis brevibus circa basin axeos congestis, floribus hexameris.

Arborea; rami robusti glabri, cicatribus foliorum conspicuis; medulla lamellata alba. Petioli basi dilatati subamplexicaules, elongati, 9–25 cm. longi, glabri; lamina digitatim 5–9 (vulgo 7–9)-foliolata; foliola petiolulis 5–20 mm. longis, oblanceolata, basi acuminata, apice caudato-attenuata, supra glabra lucida, infra glaucina vel glauca, glabra; inflorescentia in apice rami hornotini terminales 20–30 cm. longa, racemosa basi ramis brevibus decomposita, initio minute stellulata sed mox glabrescens. Bracteae 4–8 mm. longae, ovatae; bracteolae minimae vix 1 mm. longae; pedicelli saepe deflexi, 4–6 mm. longi; calycis tubus obovato-turbinatus, glaber, 2 mm. longus, stellulato-ciliatus; limbus brevis, obsolete 6-dentatus; petala 6, 2 mm. longa, elongato-triangularia, intus costata, apice unguiculata; stamina 6, petalis longiora; antherae rotundatae biloculares. Connectivum punctatum, non productum. Styli in columnam unicam connati, 0.5–0.8 mm. longi; stigma obsolete 6-lobatum; ovarium 6-loculare. Fructus 5–7 mm. longi, sphaerici, apice in stylos persistentes circiter 2 mm. longos rostrati.

FORMOSA: in monte Niitakayama, alt. 2000 m., *T. Kawakami* et *U. Mori*, no. 1705; Tozan, *G. Nakahara;* in monte Arisan, *G. Nakahara;* ibidem, *E. H. Wilson*, nos. 9733, 10811.

Agalma lutchuense Nakai, sp. nov.

Schefflera octophylla Ito & Matsumura in Jour. Coll. Sci. Tokyo, XII. 537 (1899).—Matsumura, Ind. Pl. Jap. II. 2, 422 (1912).—Non Harms.

Heptapleurum octophyllum Forbes & Hemsley in Jour. Linn. Soc. XXIII. 342 (1888), quoad pl. e Lutchu.—Henry in Trans. As. Soc. Jap. XXIV. suppl. 88 (List Pl. Formos.) (1896), pro parte.—Matsumura & Hayata in Jour. Coll. Sci. Tokyo, XXII. 178 (Enum. Pl. Formos.) (1906).—Hayata in Jour. Coll. Sci. Tokyo, XXV. art. IX. 107 (Fl. Mont. Formos.) (1908), pro parte; Icon. Pl. Formos. II. 60 (1912).—Kanehira, Formos. Trees, 278 (1917).—Non Hance.

Differt ab *Agalmate octophyllo* Seemann quocum adhuc confusum, foliis et inflorescentia rufescenti-stellulatis, foliolis 7–10 (non 5–8), paniculis dilatatis.

Arbor magna; truncus diametro usque 1 m.; cortex fuscescens; rami robusti lucidi; medulla solida. Petioli 10–15 cm. longi, basi dilatati amplexicaules, glabri; foliola 7–11 (vulgo 8–11), omnia longe petiolulata, oblanceolata vel lineari-oblonga vel elliptica, integra rarius sinuata, basi acuta vel attenuata apice acuminatissima, supra primo sparsim minute stellulata sed glabrescentia, opaca, subtus rufescenti-stellulata, 3–25 cm. longa, rosularum saepe paucidentata vel sinuata; petioluli 1–11 cm. longi. Panicula ampla 10–25 cm. longa, ambitu rotundata, dense stellulata, ramis inferioribus longioribus; calycis tubus obovatus sparsim stellulatus 1.5 mm. longus, limbus brevissimus obsolete 5-dentatus; petala 5, viridia, patentia, 2 mm. longa, triangularia, intus supra medium costata, apice unguiculata; stamina 5, patentia, 5 mm. longa; antherae subrotundae;

discum in stylum brevem sensim elevatum; stigma obscure 5-lobum; ovaria 5-(rarissime 6)-locularia. Bacca atropurpurea sphaerica, 4–6 mm. longa.

LIUKIU: Nase insulae Oshima, *T. Uchiyama;* ibidem, *E. H. Wilson*, no. 8016; Kumage insulae Tanegashima, *S. Tanaka;* in monte Ubashimata insulae Okinawa, *J. Matsumura;* insula Okinawa, *T. Miyagi*, sine loco speciali, *C. Wright*, no. 101.

FORMOSA: Kelung, *T. Makino;* Horisha, *K. Miyake;* Tamsui, *A. Henry*. no. 1780, 1735a; Bankinsing, *A. Henry*, no. 57; Taihoku, *E. H. Wilson*, no, 10269; Tamsuy, *R. Oldham*, no. 199.

KYUSHU: prov. Osumi (*coll.* ?); Idzumimura, prov. Satsuma, *Z. Tashiro;* insula Yakushima, *E. H. Wilson*, no. 6108.

Heptapleurum Gaertn.

Heptapleurum Gaertner, Fruct. Sem. II. 472, t. 178, t. 1 (1791).—Seemann in Jour. Bot. II. 297, in nota sub. gen. Agalmate (1864); III. 75 (1865); VI. 164 (1868).—Bentham & Hooker, Gen. Pl. I. 942 (1867), pro parte.

Aralia sect. *Paratropia* Blume, Bijidr. 873 (1826).

Heptapleurum subgen. *Eu-Heptapleurum* C. B. Clarke in Hooker, Fl. Brit. Ind. II. 729 (1879).

Paratropia De Candolle, Prodr. IV. 265 (1830).—Wight & Arnott, Prodr. Fl. Ind. Or. I. 377 (1831).—G. Don, Gen. Syst. III. 395 (1834).—Endlicher, Gen. Pl. 795 (1836–40).—Miquel, Fl. Ind. Bat. I. 752 (1855); in Ann. Mus. Bot. Lugd.-Bat. I. 19 (1863).

Schefflera Sect. *Heptapleurum* Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 38 (1894).

Arbusculae epiphyticae plus minus scandentes. Folia alterna, digitata. Umbellae racemosae vel paniculatae; calycis limbus brevissimus, subtruncatus, 5–7 (8–12)-dentatus; petala 5–7 (8–12), aestivatione valvata, caduca, vulgo purpurea vel sanguinea; stamina 5–7 (8–12); filamenta subulata vel subfiliformia; antherae rotundatae; connectivum parvum, non productum; styli nulli; stigmata in disco immersa, persistentia; ovarium 5–7-loculare. Drupae maturae subsiccae angulato-sulcatae; pyrenae chartaceae.—Circiter 40 species in Asia trop. et insulis Pacificis.

Heptapleurum arboricolum Hayata, Icon. Pl. Form. VI. 23 (1916).

Heptapleurum octophyllum A. Henry in Trans. As. Soc. Jap. XXIV. suppl. 48 (List Pl. Formos.) (1896), pro parte.—Hayata in Jour. Coll. Sci. Tokyo, XXV. art. IX. 107 (Fl. Mont. Formos.) (1908), pro parte.—Non Hance.

Schefflera arboricola Hayata, Icon. Pl. Formos. VI. 23 (1916), pro syn.

FORMOSA: in monte Kakubansan, *S. Sasaki;* Shisangan, *T. Makino;* in monte Niitakayama 3000 m., *T. Kawakami* et *U. Mori*, no. 1899; South Cape, *A. Henry*, no. 297, 1358, 1358A; Bankinsing, *A. Henry*, no. 1718; Kuram, prov. Koshun, *E. H. Wilson*, no. 11027; circa Keitoa, prov. Nanto, *E. H. Wilson*, no. 9828.

Boerlagiodendron Harms

Boerlagiodendron Harms in Engler & Prantl, Nat. Pflanzenfam. III. art. 8, 31 (1894).

Genus eximie polymorphum forsan in plura genera dividendum.

Boerlagiodendron kotoense Nakai, comb. nov.

Osmoxylon kotoensis Hayata, Icon. Pl. Form. VI. suppl. 33 (1917), nom. nud.
Boerlagiodendron pectinatum Hayata, Icon. Pl. Formos. X. 27 (1920), non Merrill.

Differt a *Boerlagiodendron pectinato* Merrill quocum adhuc confusum cristulis non pectinatis sed barbatis, floribus ramorum lateralium pedicellatis.

Arbor; rami robusti glabri. Folia longe petiolata; petioli teretes basi distincte ligulati et cristulis longe barbatis tribus instructi, barbis 1.0–1.5 cm. longis; lamina ad medium palmatim 5-loba, basi integra rotundato-mucronata, lobis elliptico-lanceolatis grosse crenato-serratis, supra viridia lucida, infra pallida. Umbellae terminales breviter pedunculatae, bracteis ovatis acuminatis; radii 4-fidi; rami mediani in nostris speciminibus decidui, laterales 4 cm. longi, medio 2-bracteolati; pedicelli 3–6 mm. longi; calycis limbus nullus. Fructus 5-sulcatus; stigma depresso-capitatum.

FORMOSA: insula Kotosho vel Botel-Tobago, *T. Kawakami & S. Sasaki*, no. 59.

According to Mr. Sasaki this tree grows in wet shady places on the island of Botel-Tobago. It is about 7 m. high and its trunk is almost 10–12 cm. in diameter; the branches are scanty.

Gilibertia Ruiz & Pav.

Gilibertia Ruiz & Pavon, Fl. Peruv. Chil. Prodr. 50, t. 8 (1794); ed. 2, 40, t. 8 (1797).—De Candolle, Prodr. IV. 255 (1830).—G. Don, Gen. Syst. III. 387 (1834).—Endlicher, Gen. Pl. 794 (1836–40).—Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 3 (1863).—Bentham & Hooker, Gen. Pl. I. 944 (1867).—Marchal in Martius, Fl. Brasil. XI. pt. I. 246 (1878).—Harms in Engler & Prantl, Nat. Pflanzen fam. III. abt. 8, 40 (1894). Non J. F. Gmelin.[1]

Dendropanax Decaisne & Planchon in Rev. Hort. 1854, 107.—Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 3, 26 (1863).—Seemann in Jour. Bot. II. 299 (1864); Rev. Heder. 27 (1868).—Bentham & Hooker, Gen. Pl. I. 943 (1876).
Textoria Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 3, 12 (1863).

Sect. I. EUGILIBERTIA Nakai.

Umbellae decompositae. Flores 6–8-meri.

Sect. II. DENDROPANAX Nakai.

Umbellae decompositae. Flores 5-meri.

Sect. III. TEXTORIA Nakai.

Umbellae simplices vel basi tantum ramosae. Flores 5-meri. Species Asiaticae omnes huc ducendae.

Gilibertia morbifera Nakai, comb. nov.

Dendropanax morbiferum Léveillé in Fedde, Rep. Spec. Nov. VIII. 493 (1910).

[1] Gilibertia J. G. Gmelin (Syst. Nat. II. 682 (1791)) is a synonym of the older and valid generic name Quivisia Cavanilles.

Arbor magna usque 15 m. alta, ramosa; truncus cinereus, diametro usque ad 8 dm.; rami hornotini robusti, lucidi, virides. Folia lucida, petiolis 1–13 cm. longis supra planis v. subcanaliculatis, laminis ovatis vel oblongis, rosularum trifidis, integris sed repandulis basi subtrinerviis usque ad 20 cm. longis 10 cm. latis. Umbellae terminales, vulgo simplices; pedunculi 3–5 cm. longi; pedicelli 5–10 cm. longi. Fructus ellipsoideus vel late ellipsoideus, maturus niger, 7–10 mm. longus, stylo columnari apice 5-lobulato persistente 1.5–2.0 mm. longo coronatus.

QUELPAERT: between Saishu and monastery, *E. H. Wilson*, no. 9443; secus torrentes, *U. Faurie*, no. 547; in silvis Hallasan, 600 m., *E. Taquet*, no. 4463, 2920; in silvis Hongno, *E. Taquet*, no. 180, *U. Faurie*, no. 1660; *T. Nakai*, no. 848; in silvis, *T. Nakai*, no. 6360, 6359; *T. Ishidoya*, no. 272; in silvis, *E. Taquet*, no. 895, 896.

KOREA: in silvis Choto, *T. Nakai*, no. 9643; in monte Mongansan insulae Daikokuzanto, *T. Ishidoya*, no. 3642; in insula Okto, *T. Nakai*.

This species is the plant from which the Korean yellow lacquer is obtained. The Koreans ruthlessly slit every trunk which they find in the woods to cause the lacquer to secrete. The lacquer is insoluble in water and never deteriorates if kept therein. The yellow furniture seen in Korean shops is lacquered with it. *Gilibertia trifida*, the Japanese species, is similar in its appearance, but the resin found within the bark is colorless. It is of smaller size than the Korean species, and its fruit is spherical.

Gilibertia trifida Makino in Tokyo Bot. Mag. xv. 91 (1901).—Matsumura Ind. Pl. Jap. II. pt. 2, 419 (1912).

Acer trifidum Thunberg, Fl. Jap. 163 (1784).—Persoon, Syn. Pl. II. 418 (1807).—Willdenow, Spec. IV. 991 (1806).—De Candolle, Prodr. I. 595 (1824).—Sprengel, Syst. Veg. II. 224 (1825).

Fatsia ? Mitsude De Vries, Tuinbouw Fl. III. 287 (1856).

Hedera japonica Junghuhn in Tijdschr. Natuurl. Geschied. Phys. VII. 307 (1840) (Nov. Gen. Spec. Pl. Jav. 25) (1840).—Walpers, Rep. II. 431 (1843).

Textoria japonica Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 12 (1863); Prol. Fl. Jap. 90 (1867).

Dendropanax japonicum Seemann in Jour. Bot. II. 301 (1864); Rev. Hedr. 27 (1868).—Franchet & Savatier, Enum. Pl. Jap. I. 191 (1875).—Biessner, Schelle & Zabel, Handb. Laubholz.-Ben. 362 (1903).

Aralia Mitsude Siebold apud Lavallée, Arb. Segrez. 125 (1877).

Gilibertia japonica Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 41 (1894).—Ito & Matsumura in Jour. Coll. Sci. Tokyo, XII. 271 (Tent. Fl. Lutch.) (1899).

Dendropanax trifidum Makino in Tokyo Bot. Mag. xv. 91 (1901), pro synon.

Hedera rhombea Siebold & Zuccarini in Abh. Akad. Muench. IV. pt. II. 202 (Fl. Jap. Fam. Nat. I. 94) (1845), pro parte, fide Tobler; nomen nud.

TSUSHIMA: in silvis montis Sumo-shiratake, *T. Nakai;* in monte Ariakeyama, *Y. Yabe*.

KYUSHU: in prov. Satsuma (*coll.?*); Obi, prov. Hiuga, *K. Saida*, *E. H. Wilson*, no. 6225; in insula Yakushima, *U. Faurie*, no. 3983, *E. H. Wilson*, no. 6018.

LIUKIU: in insula Okinawa, *M. Morita*.

SHIKOKU: Kofumura, prov. Awa, *J. Nikai*, no. 2491; Nanokawa, prov. Tosa, *K. Watanabe*.

HONDO: in insula Niijima, prov. Idzu, *S. Okubo;* Wakanoura, prov. Kii, *R. Yatabe;* Yada, prov. Suwo, *J. Nikai*, no. 397; Enoshima insulae Sagami, *E. H. Wilson*, no. 7781; ibidem, *H. Sakurai;* Otaki, prov. Kadzusa (*coll.* ?); Komono, prov. Ise, *I. Sono;* Yokohama, *J. Maximowicz.*

Gilibertia sinensis Nakai, sp. nov.

Dendropanax japonicum Forbes & Hemsley in Jour. Linn. Soc. XXIII. 342 (1888).—Dunn & Tutcher in Bull. Misc. Inform. Kew, add. ser. X. 119 (1912).—Non Seemann.

Rami annotini cinerei lenticellis punctati, hornotini virides glabri. Petioli 0.5–5.0 cm. longi, supra canaliculati, foliorum ramorum elongatorum usque ad 12 cm. longi. Folia ramorum elongatorum 3–5-fida usque ad 18 cm. longa et 21 cm. lata, lobis oblanceolatis acuminatis denticulatis. Umbellae glabrae, simplices vel basi ramosae; bracteae ovatae acuminatae; pedunculi 2–3 cm. longi; bracteolae involucrantes parvae triangulares; pedicelli basi rufo-barbati, circiter 1 cm. longi; flores 30–150 in quaque umbella, densi; calycis lobi 5, breves, mucronulati; petala 5, triangularia, 2 mm. longa, reflexa; stamina 5, erecta; filamenta 2.5–3.0 mm. longa; styli 5, connati, apice liberi, post anthesin stellatim divergentes.

CHINA: Kwangtung, *E. D. Merrill*, no. 1374, 1376, 1433, 1525; in monte Lofouschan, alt. 1000 m., *H. Handel-Mazzetti*, no. 132; Tien-Tai-Shan, prov. Che-kiang, *J. Hers*, no. 331; prope Chang-hua, prov. Che-kiang, *F. N. Meyer*, no. 1530; Fukien, near Foochow, *J. B. Norton*, no. 1363.

This new species which is closely allied to the Japanese *G. trifida* may be distinguished by its stellate stigma.

Gilibertia pellucido-punctata Hayata, Icon. Pl. Form. II. 62 (1912).—Kanehira, Formos. Trees 276, fig. (1918).

Dendropanax spec. Hayata in Jour. Coll. Sci. Tokyo, XXV. art. XIX. 110 (Fl. Mont. Formos.) (1908).

FORMOSA: in monte Arisan, *B. Hayata;* in monte Niitakayama, *T. Kawakami & U. Mori*, no. 2041; in monte Arisan, prov. Kagi, *E. H. Wilson*, no. 9773.

Styli apice liberi, post anthesin divergentes.
  Ramus gracilis. Folia subtus pellucido-punctata. Inflorescentia 10–20-flora. *G. pellucido-punctata.*
  Ramus robustus. Folia epunctata. Inflorescentia 30–150-flora.... *G. sinensis.*
Styli in columnam connati.
  Lactifera. Fructus ellipsoideus..... *G. morbifera.*
  Resinifera. Fructus sphaericus..... *G. trifida.*

Hedera L.

Hedera [Tournefort, Instit. Rei Herb. 612, 384 (1700).—Linnaeus, Gen. 160 (1737); Hort. Cliff. 74 (1737).—] Linnaeus, Gen. ed. 5, 94 (1754).—De Candolle, Prodr. IV. 261 (1830), pro parte, non Swartz.—G. Don, Gen. Syst. III. 391 (1834).—Endlicher, Gen. Pl. 795 (1836–40), pro parte.—Bentham & Hooker, Gen. Pl. I. 946 (1867), pro parte.—Harms in Engler & Prantl, Pflanzenfam. III. abt. 8, 41 (1894).

Species 7 in Europe et Asia incolae, inter eas tres in Imperio Japonicoi sponte nascent.

Pedunculi elongati 12 cm. longi. Pedicelli 2–4 cm. longi.....*H. pedunculata.*
Pedunculi quam 5 cm. breviores. Pedicelli circiter 1 cm. longi.
Petala circiter 2 mm. longa. Folia ramorum floriferorum lanceolata v. ovata *H. formosana.*
Petala circiter 3 mm. longa. Folia ramorum floriferorum ovata v. angulata, rarius lanceolata.....*H. japonica.*

Hedera pedunculata Nakai, sp. nov.

Hedera Helix Ito & Matsumura in Jour. Coll. Sci. Tokyo, XII. 539 (1899), pro parte?; non Linnaeus.

Rami juvenilespilis stellulato multiradiatis sparsim vestiti. Folia biennia; petioli 1–3 cm. longi, juveniles sparsissime stellulati sed mox glabrescentes; lamina foliorum ovato-lanceolata vel ovata, supra viridis lucida,infra pallida, venis elevatis, 3 cm. lata et 7 cm. longa (3 : 6.5, 2.4 : 6.c, 2.3 : 5.5, 1.4 : 3.0 etc.). Pedunculi 12 cm. longi, ramo solitario instructi, subglabri; bracteae ovatae, dense fusco-stellulatae; pedicelli 2–4 (rarissime 1) cm. longi, stellulato-pilosi; calycis tubus turbinatus, stellulatus, edentatus; petala triangularia vel ovata, 3 mm. longa, valvata, intus medio costato-elevata; stamina 5; filamenta 2 mm. longa; antherae ovatae, 1 mm. longae; connectivum evolutum; discus conicus, rarissime stellulatus, in stylum brevem abiens; stigma obscure 3-lobum. Bacca ignota.

LIUKIU: sine loco speciali, *S. Yajima.*

Hedera formosana Nakai, sp. nov.

Hedera Helix Hayata in Jour. Coll. Sci. Tokyo, XXIV. art. XIX. 110 (Fl. Mont. Formos.) (1909); Icon. Pl. Formos. II. 62 (1912).—Matsumura, Ind. Pl. Jap. II. 2,.419 (1912), pro parte.—Non Linnaeus.

Rami juveniles subglabri, rarissime stellulati. Petioli 1.0–5.5 cm. longi, glaberrimi; folia lanceolata vel late lanceolata vel subrhombea, basi cuneata vel late cuneata, apice attenuata plus minus obliqua, supra glabra lucida, infra pallida glabra. Umbellae subcorymbosae, stellulato-pilosae; bracteae minutissimae; pedicelli 6–8 mm. longi, stellato-pilosi; calycis tubus breviter turbinatus, dense stellulato-pilosus, 1 mm. longus; petala subreflexa, ovata, intus supra medium costato-elevata, 2.0–2.5 mm. longa, extus stellulata; filamenta 2 mm. longa; antherae ovatae; connectivum haud evolutum; discum brevissime conicum; styli 1 mm. longi; stigmata obscure 5-lobata. Bacca (fide Sasaki) nigra.

FORMOSA: in monte Morrison, 6000 ped., *T. Kawakami & U. Mori*, no. 2017; Tapposha, *T. Kawakami & U. Mori*, no. 1970; in monte Morrison, 2100 m. ped., *T. Kawakami & U. Mori*, no. 1887; in monte Arisan, prov. Kagi, *E. H. Wilson*, no. 9697, 10801; Sozan, *E. H. Wilson*, no. 11237.

Hedera japonica Tobler, Gatt. Hedera, 84, fig. 43–44a (1912).—Fedde, Rep. Spec. Nov. XIII. 160 (1914).—Rehder in Bailey, Stand. Cycl. Hort. III. 1438 (1914).—Non Junghuhn.

Hedera rhombea Siebold & Zuccarini in Abh. Akad. Muench. IV. pt. II. 202 (Fl. Jap. Fam. Nat. I. 94) (1845), pro parte, nomen nud.—Lavallée, Arb. Segrez. 126 (1877), nomen nud.—Bean, Trees & Shrubs Brit. Isles, I. 609 (1914).

Hedera Helix Thunberg, Fl. Jap. 102 (1784).—Siebold & Zuccarini, l. c.—Franchet & Savatier, Enum. Pl. Jap. I. 194 (1875).—Non Linnaeus.

Hedera Helix var. *rhombea* Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 13 (1863), incl. f. angustifolia et latifolia.—Franchet & Savatier, Enum. Pl. Jap. I. 195 (1875).—Nicholson, Gard. Dict. II. 122 (1887).—Beissner, Schelle & Zabel, Handb. Laubholz.-Ben. II. 122 (1887).

Hedera colchica Seemann in Jour. Bot. II. 307 (1864), pro parte.—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 42 (1894), pro parte.—Palibin in Act. Hort. Petrop. XVII. 99 (Consp. Fl. Kor. I.) (1898).—Nakai, Fl. Kor. I. 274 (1909).—Non K. Koch.

? *Hedera japonica* Paul in Gard. Chron. 1867, 1215; in Florist & Pomol. 1870, 272.

Hedera Helix v. *japonica* Lavallée, Arb. Segrez. 126 (1877), nom. nud.

Hedera japonica Siebold ex Lavallée, l. c. (1897), pro synon.

Hedera Helix var. *colchica* Makino in Tokyo Bot. Mag. VIII. 300 (1894); non K. Koch.

DAGELET: in rupibus Dodo, *T. Ishidoya*, no. 104; ibidem, *T. Nakai*, no. 4473, ibidem, *E. H. Wilson*, no. 8571; sine loco speciali, *K. Okamoto;* in arboribus Taika, *T. Nakai*, no. 4474.

KOREA: in rupibus Chojyo, *T. Nakai*, no. 1010; in rupibus montis Paiyangsan, *T. Nakai*, no. 1036; in rupibus insulae Setto, *T. Nakai*, no. 9645; in arboribus montium Roseidai, *T. Nakai*, no. 9644; in arboribus Dojiri, *T. Nakai*, no. 9747; in arboribus insulae Pogilto, *T. Nakai*, no. 9746; in arboribus insulae Okto, *T. Nakai*, no. 471; in insula Zetsueito, *T. Uchiyama;* in insula Soanto, *Y. Hanabusa;* Mokpo, *T. Uchiyama.*

QUELPAERT: in rupibus Tschejyu, *T. Nakai*, no. 6357; in sepibus Hongno, *T. Nakai;* Saishu, *E. H. Wilson*, no. 9318; in rupibus Yontanri, *T. Nakai*, no. 201; sine loco speciali, *T. Mori*, no. 80; in rupibus, *T. Ishidoya*, no. 256; in muris, *E. Taquet*, no. 139; in muris Hongno, *E. Taquet*, no. 888, 2918.

LIUKIU: Kekeah Isl., *C. Wright*, no. 102.

KYUSHU: Tarumimura, prov. Osumi, *Y. Nakano;* in monte Kirishima, *R. Yatabe;* ibidem, *Z. Tashiro;* in monte Higashikirishima, *E. H. Wilson*, no. 6188; in insula Tanegashima, *E. H. Wilson*, no. 6150; Nagasaki, *J. Maximowicz;* ibidem, *R. Oldham*, no. 316.

SHIKOKU: Kamomyomura, prov. Awa, *J. Nikai*, no. 2492; Nanokawa, prov. Tosa, *K. Watanabe.*

HONDO: Tanabe, prov. Kii, *I. Sono;* Okunimoto, prov. Uzen, *K. Nemoto;* Kuroiwa, prov. Iwashiro, *K. Nemoto;* Tokyo, *J. Matsumura;* in prov. Kii, *Hibino;* Hikami, prov. Suwo, *J. Nikai*, no. 396; Wakanoura, prov. Kii. (coll. ?); in insula Oshima, prov. Idzu, *G. Koidzumi;* ibidem, *E. H. Wilson*, no. 8190; Numadzu, prov. Suruga (coll. ?); Shiogama, prov. Rikuzen, *U. Faurie*, no. 6842; ibidem, *J. G. Jack;* Hakone, prov. Sagami, *C. S. Sargent;* Naba, prov. Harima, *K. Omura;* in monte Amagi, prov. Idzu, *S. Okubo;* ibidem, *H. Matsudaira;* Simoda, prov. Idzu, *C. Wright.*

Hedera japonica f. variegata Nakai.

Hedera rhombea variegata Paul in Gard. Chron. 1867, 1215; in Florist & Pomol. 1870, 272.

Hedera Helix submarginata Hibbert, Ivy, 80, fig. (p. 89) (1872).

Hedera Helix var. *japonica foliis variegatis* Lavallée, Arb. Segrez. 126 (1877).

Hedera Helix var. *rhombea variegata* Rehder in Bailey, Cyclop. Am. Hort. II. 716 (1901).

Hedera Helix rhombea marginata hort. apud Beissner, Schelle & Zabel, Handb. Laubholz.-Ben. 364 (1903).

Folia albo-marginata. In hortis Japonicis sat vulgaris.

Hedera japonica f. argentea Nakai.

Hedera Helix rhombea argentea hort. apud Beissner, Schelle & Zabel, Handb. Laubholz.-Ben. 364 (1903).

Folia variegata saepe fere alba.

Hedera Helix rhombea ovata Beissner, Schelle & Zabel l. c. is hardly distinguishable.

Pentapanax Seem.

Pentapanax Seemann in Jour. Bot. II. 294 (1864), pro parte.—Bentham & Hooker, Gen. Pl. I. 936 (1867), pro parte.—C. B. Clarke in Hooker, Fl. Brit. Ind. II. 724 (1879), pro parte.—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 55 (1897), pro parte.

As H. Harms has already pointed out (in Bot. Jahrb. XXIII. 20–21 (1896)) *Pentapanax racemosum* and *P. subcordatum* are better separated from the other species of Pentapanax; they are terrestrial plants with the inflorescence arranged in racemes.

Pentapanax castanopsidicola Hayata, Icon. Pl. Form. V. 74, f. 15, t. 7 (1915), "castanopsisicola."

FORMOSA: Funkiko, *B. Hayata;* in monte Arisan, prov. Kagi, *E. H. Wilson,* no. 10899.

Dr. Hayata seems to have based his description of the flowers on the figures drawn by F. Hayami who mistook the black fungus on the half rotten specimen for hairs. He also overlooked the existence of *Pentapanax verticillatum*, *P. yunnanense* and *P. Henryi* in China and wrote of the genus as new to the East Asiatic flora.

Aralia L.

Aralia [Tournefort, Instit. Rei Herb. 300, t. 154 (1700).—Linnaeus, Gen. Pl. 88, n. 251 (1737); Hort. Cliffort. 113 (1737)].—Linnaeus, Gen. Pl. ed. 5, 134 (1754).—Houttuyn, Pflanzensyst. I. 408 (1777).—Jussieu, Gen. Pl. 218 (1789).—Ventenat, Tabl. III. 3 (1799).—Persoon, Syn. Pl. I. 331 (1805), pro parte.—De Candolle, Prodr. IV. 257 (1830), pro parte.—G. Don, Gen. Syst. III. 388 (1834), pro parte.—Endlicher, Gen. Pl. 794 (1836–40).—C. B. Clarke in Hooker f., Fl. Brit. Ind. II. 721 (1879), excl. sect. Ginseng.—Bentham & Hooker, Gen. Pl. I. 936 (1867), excl. sect. Ginseng.—Seemann in Jour. Bot. VI. 133 (1868).—Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 6 (1863).—Sargent, Silva N. Am. V. 57 (1893).—K. Koch, Dendr. I. 672 (1869).—Britton & Brown, Ill. Fl. II. 505 (1897).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 56 (1897), excl. Ab; in Bot. Jahrb. XXIII. 11 (1896).

Dimorphanthus Miquel, Comm. Phyt. 95, t. 12 (1838).—Endlicher, Gen. Pl. Suppl. II. 70 (1842).

Aralia sect. *Dimorpanthus* Miquel in Fl. Ind. Bat. I. 749 (1885); in Ann. Mus. Bot. Lugd.-Bat. I. 6 (1861).

Flores polygamo-monoeici.

Herbae perennes. Folia ternato-pinnata.
Glabra. Pedicelli 1–2 cm. longi.....*A. glabra.*
Plus minus praecipue in inflorescentia pilosa. Pedicelli 1.0–1.5 cm. longi.
Calycis tubus glaber.....*A. cordata.*
Calycis tubus rufescenti-pilosus.....*A. cordata* var. *sachalinensis.*
Frutices vel arbusculae.
Foliola ovato-lanceolata, subtus glauca, glaberrima. Inflorescentia rufescenti-pilosa.....*A. hypoleuca.*
Foliola ovata vel late ovata vel ovato-oblonga.
Rachis foliorum fuscescente-barbata; foliola ovato-oblonga, grosse dentata, subtus glaucina et fuscescenti-pubescentia.....*A. Decaisneana.*
Rachis foliorum glabra sed saepe aculeata.
Folia subtus glaucescentia secus venas glabra vel pilosa.....*A. elata.*
Folia subtus fuscescenti- vel albescenti-pubescentia
A. elata var. *canescens.*

Aralia glabra Matsumura in Tokyo Bot. Mag. XI. 441 (1897), nom. nud.; XII. 17 (1899); Ind. Pl. Jap. II. pt. 2, 418 (1912).—Komatsu in Matsumura, Icon. Pl. Koishik. I. 143 Pl. 72 (1913).

HONDO: Yumoto, prov. Shimotsuke, *J. Matsumura, H. Sakurai, S. Komatsu;* Komagatake, prov. Shinano, *H. Sakurai.*

Aralia cordata Thunberg, Fl. Jap. 127 (1784).—Willdenow, Sp. Pl. I. 1519 (1797).—Persoon, Syn. Pl. I. 331 (1805).—Sprengel, Syst. I. 952 (1825).—De Candolle, Prodr. IV. 258 (1830).—G. Don, Gen Syst. III. 389 (1834).—Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 9 (1863).—Franchet & Savatier, Enum. Pl. Jap. I. 191 (1875).—Marchal in Bull. Soc. Bot. Belg. XX. 86 (1881).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 57 (1894); in Bot. Jahrb. XXIII. 15 (1896).—Komarov in Act. Hort. Petrop. XXV. 125 (Fl. Mansh. III.) (1907).—Matsumura, Ind. Pl. Jap. II. pt. 22, 418 (1912).—Rehder in Bailey, Stand. Cyclop. Hort. I. 344 (1914).

Aralia edulis Siebold in Verh. Batav. Genootsch. XII. no. 1. 45 (Syn. Pl. Oecon. Jap.) (1830).

Aralia edulis Siebold & Zuccarini, Fl. Jap. I. 57, t. 25 (1837); in Abh. Akad. Muench. IV. pt. II. 201 (Fl. Jap. Fam. Nat. I. 93) (1845).—Seemann in Jour. Bot. VI. 134 (1868).

Aralia nudicaulis Blume, Bijidr. 870 (1826); non Linnaeus.

Aralia nutans Franchet & Savatier, Enum. Pl. Jap. II. 376 (1879).

Aralia racemosa var. *sachalinensis* Makino in Tokyo Bot. Mag. VIII. 224 (1894); non Regel.

Dimorphanthus edulis Miquel, Comm. Phyt. 96 (1837).—Walpers, Repert. II. 431 (1843).

DAGELET: in silvis Dodo, *T. Nakai*, no. 4638; in silvis Joho, *T. Nakai*, no. 4752; in Dodo, *T. Ishidoya*, no. 105; sine loco speciali, *K. Okamoto.*

SAGHALIN: Dui, *Glehn.*

MANSHURIA: circa Schisidagon, prov. Mukdensis, *V. Komarov*, no. 1152.

KOREA: in monte Kantairei, *T. Mori;* Chodado, *T. Nakai*, no. 3685; Taikori, *T. Nakai*, no. 3463; in monte Chirisan, *T. Nakai*, no. 759; in montibus Gensan, *U. Faurie*, no. 209.

CHINA: Pan lan shan, prov. Szechuan, *E. H. Wilson*, no. 4285.

QUELPAERT: in silvis Hallaisan, alt. 1200 m., *E. Taquet*, nos. 5663, 5664; in sepibus Yengsil, *E. Taquet*, no. 4465; in herbidis Hallaisan, *E. Taquet*, no. 138.

KYUSHU: Yoshino, prov. Satsuma, *Z. Tashiro;* Nagasaki, prov. Hizen, *R. Oldham*, no. 310.

SHIKOKU: in monte Ishidzuchisan, prov. Iyo, *G. Koidzumi;* Nanokawa, prov. Tosa, *K. Watanabe.*

HONDO: pede montis Iidesan, *J. Matsumura;* in monte Ontakesan, *G. Koidzumi;* Nikko, *K. Sawada;* Kohara, prov. Echizen, *J. Matsumura;* Hikami, prov. Suwo, *J. Nakai*, no. 399; Aomori, prov. Mutsu, *R. Yatabe;* Nasuno, prov. Shimotsuke, *H. Sakurai;* in monte Iwatesan, prov. Mutsu, *H. Sakurai;* Yokohama, prov. Musashi, *C. J. Maximowicz.*

YESO: Sapporo, *R. Yatabe;* ibidem, *S. Arimoto;* Muroran, prov. Iburi, *J. Matsumura;* sine loco speciali, *L. Boehmer;* Hakodate, prov. Oshima, *Albrecht.*

Aralia cordata var. **sachalinensis** Nakai, comb. nov.

Aralia racemosa var. *sachalinensis* Regel in Gartenfl. XIII. 100, t. 432 (1864).

Vulgo elatus. Calycis tubus pilosus.

YESO: in declivitate Zenibako, *T. Nakai.*

SAGHALIN: Sine loco speciali, *Migul.*

The variety *sachalinensis* differs from the type in its pubescent calyx. Regel says "Blüthenstiele und Fruchtknoten dicht kurzhaarig." His Fruchtknoten does not mean ovary but the calyx-tube. In the type the calyx-tube is perfectly smooth. Fr. Schmidt (in Mém. Acad. Sci. St. Pétersb. ser. 7, XII. no. II. 141 [1868]) says "Calycibus majoribus oblongis quam petala longioribus." If this character is true for his specimen, it must be a variety distinct from the true *sachalinensis*; in Regel's figure the lobes of calyx are small and never exceed the petals. Makino's var. *sachalinensis* is the typical Udo, *Aralia cordata,* as the specimens bearing this name in his handwriting prove.

Aralia hypoleuca Presl, Epim. Bot. 250 (1849).—Hayata in Jour. Coll. Sci. Tokyo, XXX. art. I. 131 (1909); Icon. Pl. Formos. II. 58 (1912).—Kanehira, Formos. Trees, 273 (1917).

Aralia spinosa Forbes & Hemsley in Jour. Linn. Soc. XXIII. 338 (1888), quoad pl. e Formosa; non Linnaeus.

PHILIPPINES: monte Umingan insulae Luzon, *Ramos & Edano*, no. 26495; Isl. Negros, *Elmer*, no. 10427.

FORMOSA: in monte Arisan, *E. H. Wilson*, nos. 9654, 10798; Bankinsing, *A. Henry*, no. 15; Bongari, *G. Nakahara;* Shinten, *Nagasawa*, no. 456.

LIUKIU: insula Okinawa, *M. Kawaharada.*

According to S. Sasaki, this shrub grows in dry barren land of the temperate mountain region at about 1000–2100 m. above sea-level in Formosa. It is usually found growing in a higher zone than *Aralia Decaisneana*, rarely coming down to 300–600 m. or even to the plain in the Koshun peninsula.

Aralia elata Seemann in Jour. Bot. VI. 134 (1868); Rev. Heder. 90 (1868).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 57 (1894).

Dimorphanthus elatus Miquel, Comm. Phytogr. 95, t. 12 (1840).

Aralia canescens Siebold & Zuccarini in Abh. Akad. Muench. IV. pt. II. 202 (Fl. Jap. Fam. Nat. I. 94) (1845).—Lavallée, Arb. Segrez. 125 (1877).

Dimorphanthus mandshuricus Ruprecht & Maximowicz in Mém. Div. Sav. Acad. Sci. St. Pétersb. IX. 133 (Prim. Fl. Amur.) (1859).—Fr. Schmidt in Mém. Acad. Sci. St. Pétersb. ser. 7, XII. no. II. 141 (Fl. Sachal.) (1868).

Aralia Mandshurica Seemann in Jour. Bot. VI. 134 (1868).

Aralia mandshurica Maximowicz in Bull. Phys.-Mat. Acad. Sci. St. Pétersb. XV. 134 (1856); in Mél. Biol. II. 427 (1857).

Aralia manshurica Komarov in Act. Hort. Petrop. XXV. 123 (Fl. Mansh. III.) (1907).

Aralia spinosa Miquel in Ann. Mus. Bot. Lugd.-Bat. I. p. 7 (1863), pro parte, non Linnaeus.

Aralia spinosa v. *canescens* Sargent, Silva North Am. V. 60 (1893).

Aralia chinensis v. *canescens* Koehne, Deutsch. Dendr. 432 (1893).—Dippel Handb. Laubholzk. III. 233 (1893), excl. pl. Chin.—Rehder in Bailey, Cycl. Am. Hort. I. 88 (1900).

Aralia spinosa v. *glabrescens* Franchet & Savatier, Enum. Pl. Jap. I. 191 (1875).

Aralia chinensis v. *glabrescens* Schneider, Ill. Handb. Laubholzk. II. 431 (1911), excl. Pl. Chin.—Rehder in Bailey, Stand. Cycl. Hort. I. 344 (1914).

MANSHURIA: prov. Kirinensis, *V. Komarov*, no. 1151.

AMUR: *S. Korschinsky; C. J. Maximowicz.*

USSURI: circa Vladivostok, *C. S. Sargent;* ibidem, *Topping.*

KOREA: in insula Baikato, *T. Ishidoya & Chung*, no. 3631; in silvis Taikoji, *T. Nakai*, no. 9642; in monte Keiryusan, *T. Nakai*, no. 8107; in monte Hiraiho, *T. Nakai;* in monte Kyojitsurei, prov. Heinan, *T. Mori;* in monte Kongosan, *T. Nakai*, no. 5694; ibidem, *E. H. Wilson*, no. 10691; in monte Namsan, *T. Uchiyama;* Hansan Monastery, *Mills*, no. 418; in monte Chorei, *T. Uchiyama;* in insula Okto, *T. Nakai;* Shinkabachin, *E. H. Wilson*, no. 9096.

DAGELET: sine loco speciali, *K. Okamoto;* in monte Tongimi, *T. Nakai;* ibidem, *E. H. Wilson*, no. 8543.

QUELPAERT: Hallaisan, *T. Nakai*, no. 6361; Hongno, *T. Nakai;* sine loco speciali, *T. Mori.*

TSUSHIMA: Takeshiki, *Y. Yabe;* in monte Sumo-shiratake, *T. Nakai.*

SAGHALIN: *Fr. Schmidt.*

YESO: in monte Tokachidake, *G. Koidzumi.*

HONDO: in insula Oshima, prov. Idzu, *S. Okubo;* Otsu, prov. Omi, *I. Sono;* Hikami, prov. Suwo, *J. Nikai*, no. 398; Yokohama, *K. Hisauchi;* Okunimoto, prov. Uzen, *K. Nemoto.*

LIUKIU: in insula Okinawa, *T. Miyagi.*

Aralia elata f. variegata Nakai, comb. nov.

Aralia chinensis var. *variegata* Rehder in Bailey, Stand. Cycl. Hort. I. 344 (1914).

Aralia chinensis var. *albo-marginata* Bean, Trees & Shrubs Brit. Isles, I. 197 (1914).

Folia albo-marginata.

In hortis invenitur.

Aralia elata f. aureo-variegata Nakai, comb. nov.

Aralia chinensis var. *aureo-variegata* Rehder, l. c. Bean, l. c.

Folia aureo-variegata.

In hortis invenitur.

Aralia elata var. **canescens** Nakai, comb. nov.

Aralia spinosa var. *canescens* Franchet & Savatier, Enum. Pl. Jap. I. 192 (1875).

Aralia chinensis var. *elata* Dippel, Handb. Laubholzk. III. 233 (1893).—Rehder in Bailey, Cyclop. Am. Hort. I. 82 (1900).

Aralia canescens Jäger & Beissner, Ziergeh. ed. 3, 37 (1889); non Siebold & Zuccarini.

Folia subtus albo- v. fuscescenti-velutina.

HONDO: Tokyo, *J. Matsumura;* Sendai, prov. Rikuzen, *K. Nemoto;* Yumoto, prov. Shimotsuke, *C. S. Sargent;* Chuzenji, prov. Shimotsuke, *J. G. Jack.*

YESO: sine loco speciali, *L. Boehmer;* circa Sapporo, *C. S. Sargent*; ibidem, *J. G. Jack;* Hakodate, prov. Oshima, *Albrecht.*

This species is distinguished from both *Aralia spinosa* and *A. chinensis* by the form of the inflorescence. In these two species the main axis of the inflorescence is elongated terminating the branch of the current year. Thus the inflorescence forms a terminal erect panicle. In *A. elata* the axis of the inflorescence is short and its main branches are well developed and more or less umbellate. The main branches of the inflorescence become themselves panicled spreading when in flower and drooping in fruit. *Aralia spinosa* has distinctly stalked leaflets by which it is distinguished from either *A. elata* or *A. chinensis*. *A. chinensis* has ordinarily finer serrations and more tapering leaflets than *A. elata*. We have an imperfect glabrescent specimen from Formosa. It lacks the inflorescence and I cannot ascertain to what species it really belongs. According to S. Sasaki this type grows in the whole island of Formosa below 1000 m. above sea-level and does not branch. A specimen from Western China (Wilson's no. 3692) has the leaflets minutely but sparsely ciliated all over the lower surfaces, but the pubescence is not velutinous as in the type.

Aralia chinensis Linnaeus, Spec. 273 (1753).—Houttuyn, Pflanzensyst. I. 41 (1777).—Lamarck, Encycl. Méth. I. 223 (1787).—Willdenow, Spec. I. 1520 (1797).—Persoon, Syn. Pl. I. 332 (1805).—De Candolle, Prodr. IV. 259 (1830).—G. Don, Gen. Syst. III. 389 (1834).—Seemann in Jour. Bot. VI. 133 (1868); Rev. Heder. 90 (1869).—K. Koch, Dendr. I. 673 (1869).—Jäger & Beissner, Ziergeh. ed. 3, 37 (1889), excl. syn.—Harms & Rehder in Sargent, Pl. Wilson. II. 566 (1916).

Aralia chinensis var. *canescens* Dippel, Handb. Laubholzk. III. 233 (1893), pro parte.—Schneider, Ill. Handb. Laubholzk. II. 431 (1911), quoad pl. e China.—Non Koehne.

Aralia spinosa Forbes & Hemsley in Jour. Linn. Soc. XXIII. 338 (1888), pro parte; non Linnaeus.

CHINA: Hupeh, *A. Henry*, no. 2104; ibidem, *E. H. Wilson*, no. 602; Hsingshan Hsien, *E. H. Wilson*, no. 622; prope Washan, *E. H. Wilson*, no. 1962; Ichang, *E. H. Wilson*, no. 1963; Fupe, Silvestri; Yunnan, *G. Forrest*, nos. 11505, 1256); in silva infra vicum Tungdjiapai, prope minas Hsikwangschan, prov. Hunan, *H. Handel-Mazzetti*, nos. 2447, 678, 811; Huangtsauba-Taipinggai, prov. Kweitschan, *H. Handel-Mazzetti*, no. 2020; prope Lantai Ting, prov. Kweichan, *O. Schoch*, no. 408; Ningpo Mts., *E. Faber*, no. 44.

Aralia chinensis var. **nuda** Nakai, nom. nov.

Aralia chinensis var. *glabrescens* Harms & Rehder in Sargent, Pl. Wilson. II. 567 (1911); non Schneider.

Aralia chinensis a. *elata* Dippel, Handb. Laubholzk. III. 233 (1893), quoad plantam e China.

Folia glaberrima vel infra secus costas sparcissime pilosella vel rarissime tota sparsim ciliolata. Inflorescentia tota vel apice tantum pilosa.

CHINA: Tsing si Hsien, prov. Kansu, *J. Hers*, no. 2428; Patung Hsi, prov. Hupeh, *E. H. Wilson*, no. 128; Kuling, prope Kiangsi, *E. H. Wilson*, no. 1508; Ichang, prov. Hupeh, *E. H. Wilson*, no. 128; Changyang-Hsien, *E. H. Wilson*, no. 128; Sui-an Hsien, prov. Chekiang, *J. Hers*, no. 235; Lao-yi San, prov. Shensi, *G. Giraldi*; Lushih, Tang Ho, alt. 100 m., prov. Honan, *J. Hers*, no. 948; Shih Tse Miao, alt. 1200 m., prov. Honan, *J. Hers*, no. 1271; Hai-chow Hills, prov. Kiangsu, *J. Hers*, no. 2274.

In the Arnold Arboretum there is a small plant raised from the seeds sent by J. Hers in 1919. The seeds were collected from the same tree as his specimen No. 1151.

Aralia Planchoniana Hance (in Jour. Bot. IV. 172, [1866]) is a very rusty-tomentose species and is entirely different from this. The specimen collected by C. O. Levine near Canton (no. 1853) belongs to this species.

Aralia Decaisneana Hance in Jour. Bot. IV. 172 (1866); in Ann. Sci. Nat. sér. 5, V. 215 (1866).

Aralia spinosa Forbes & Hemsley in Jour. Linn. Soc. XXIII. 338 (1888), pro parte.—Matsumura & Hayata, Enum. Pl. Form. 176 (1906), pro parte.—Hayata, Icon. Pl. Formos. II. 58 (1912).

Differt ab *A. chinensi* et *A. elata* rachi foliorum rufescenti-barbata, foliolis longioribus grosse dentatis.

FORMOSA: Hikaku, *T. Makino*.

According to S. Sasaki this species is limited to the middle part of Formosa where it grows in the low land below 1000 m. above sea-level.

Panax L.

Panax (Gronovius)[1] Linnaeus, Gen. Pl. [ed. 2, 105, no. 246 (1742);] ed. 5, 481 (1754), pro parte.—Trew, Pflanzensyst. X. 333 (1783), pro parte.—Jussieu, Gen. Pl. 218 (1789), pro parte.—Willdenow, Spec. IV. 1124 (1805), pro parte.—Endlicher, Gen. Pl. 793 (1836-40), pro parte.—Seemann in Jour. Bot. VI. 54 (1868).—Harms in Engler & Prantl, Nat. Pflanzenfam. III. abt. 8, 58 (1897); in Bot. Jahrb. XXIII. 1–3 (1896).

Araliastrum Vaillant, Sermo str. Fl. 40 (1718).—Trew, Pl. Select. t. 6. (1750).

Panax Trew apud Ventenat, Tab. Regn. Veget. III. 3 (1799).

Panax § 1. De Candolle, Prodr. IV. 252 (1830).—G. Don, Gen. Syst. III. 384 (1834).

Panax § 1. *Araliastrum* Vaillant apud Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 14 (1863).

[1] Gronovius, Fl. Virgin. II. 147 (1739).

Panax § 1. *Eupanax* Torrey & Gray, Fl. North Am. I. 607 (1838–40).
Aralia sect. 1. *Ginseng* Bentham & Hooker, Gen. Pl. I. 936 (1867).—C. B. Clarke in Hooker, Fl. Brit. Ind. II. 721 (1879.)
Panax subgenus *Aureliana* C. A. Meyer in Bull. Phys.-Math. Acad. Sci. St Pétersb. I. 340 (1843).

Linné's Panax comprises *Panax trifoliatum*, *P. quinquefolium* and *P. fruticosum*. The last, however, is a species of Nothopanax with double pinnate leaves and valvate petals. Many authors like Houttuyn, Jussieu, Willdenow, Aiton, Endlicher and others have followed him. But from the time of A. P. de Candolle many species of the Nothopanax-type have been added to the genus and its characters gradually have come to represent the conception of Decaisne & Planchon or Bentham & Hooker. Seemann who made a thorough study of the Araliaceae known at his time reverted to the Linnean conception of the genus and improved it by excluding from it *Panax fruticosum*. Harms has followed him and this is really the best disposition.

Panax japonicum C. A. Meyer in Bull. Phys.-Math. Acad. Sci. St. Pétersb. I. 340 (1840), excl. syn. *P. quinquefolium* var. *japonicum*.— Walpers, Repert. V. 924 (1846).
Panax Schin-seng var. *japonica* Nees, Icon. Pl. Medic. Suppl. fasc. 5, comp. 69, t. color. 16, B. B1 (1833).
Panax quinquefolium δ. *subsessilis* Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 14 (1863).
Panax repens Maximowicz in Bull. Acad. Sci. St. Pétersb. XII. 64 (1867); in Mél. Biol. VI. 264 (1868).—Franchet & Savatier, Enum. Pl. Jap. I. 192 (1875).—Matsumura, Ind. Pl. Jap. II. 2, 421 (1912).
Panax Ginseng var. *repens* Makino in Iinuma, Somokudzusetsu, rev. ed. I. 321 (1907).
Panax Ginseng var. *japonicum* Makino in Tokyo Bot. Mag. XXIV. 223 (1910).
Aralia repens Makino in Tokyo Bot. Mag. VIII. 225 (1894).
Aralia quinquefolia var. *repens* Burkill in Kew Bull. Misc. Inform. 1902, 6.

Panax japonicum f. **typicum** Nakai.

Foliola 5–7, duplicato-serrulata, obovata vel oblanceolata. Bacca coccinea.

Hondo: Nikko, *S. Okubo;* ibidem, *K. Sawada;* in monte Kiyozumi, prov. Awa, *S. Okubo;* in monte Chokaizan, *R. Yatabe;* Hondojisan, *R. Yatabe;* prov. Kawachi, *T. Tada;* in monte Jyujyotoge, prov. Idzu, *J. Matsumura;* Aidzu, *R. Yatabe;* in monte Takao, *S. Okubo;* in monte Ontake, *J. Matsumura;* in monte Mitake, prov. Musashi, *Y. Yabe;* in monte Komagatake, prov. Echigo, *B. Hayata;* in monte Iidesan, *R. Yatabe;* Hakone, *J. Matsumura;* in monte Kongosan, prov. Kawachi, *S. Matsuda;* in monte Hakusan, prov. Kaga, *R. Yatabe* et *J. Matsumura;* ibidem, *H. Sakurai;* in monte Hakkodasan, prov. Mutsu, *H. Koidzumi;* in monte Tateyama, prov. Etchu, *J. Matsumura;* Tenisan, prov. Iwashiro, *G. Nakahara;* Yoshino, prov. Yamato, *H. Sakurai;* in monte Komagatake, prov. Shinano, *H. Sakurai;* in monte Hiei, prov. Omi, *I. Sono;* Shikayu, prov. Mutsu, *H. Sakurai;* Chichibu, prov. Musashi, *H. Sakurai;* Kamasaki, prov. Rikuzen (coll. ?); Takaoyama, prov. Musashi, *K. Watanabe.*

YESO: sine loco speciali, *L. Boehmer;* Nopporo, prov. Ishikari, *T. Nakai;* in monte Moiwa circa Sapporo, *J. Matsumura;* Sapporo, *K. Miyabe;* ibidem, *E. Tokubuchi;* ibidem, *S. Arimoto;* Murolan, prov. Iburi, *K. Saida* Cape Sangar, *J. Small;* Hakodate, *C. J. Maximowicz.*

KYUSHU: in monte Kirishimayama, prov. Osumi, *R. Yatabe;* Fukabayama, prov. Higo, *Z. Tashiro.*

TSUSHIMA: in monte Mitake, *Otani;* in monte Tendoyama, *T. Nakai;* sine loco speciali, *C Wilford.*

Panax japonicum f. **trifoliolatum** Nakai, comb. nov.

Panax Ginseng var. *repens* f. *trifoliolatum* Makino in Iinuma's Somokudzusetsu rev. ed. 322 (1907).

Panax Ginseng var. *japonica* f. *trifoliolatum* Makino in Tokyo Bot. Mag. XXIV. 224 (1910).

Folia digitatim 3- (rarius 4)-foliolata. Fructus ut in typo.

HONDO: Nikko, prov. Shimotsuke, *K. Sawada.*

SHIKOKU: in monte Kodzusan, prov. Awa, *J. Nikai,* no. 1467.

Panax japonicum f. **lancifolium** Nakai, forma nova.

Foliola anguste oblanceolata subsimpliciter serrulata.

HONDO: monte Zissokutoge, prov. Idzu, *J. Matsumura;* in monte Kiyozumi, prov. Awa, *S. Okubo.*

KYUSHU: Obi, prov. Hiuga, *K. Saida.*

Panax japonicum f. **incisum** Nakai, forma nova.

Foliola inciso-duplicato-serrata.

HONDO: in monte Kongosan, prov. Kawachi, *S. Matsunda.*

SHIKOKU: in monte Tsurugisan, prov. Awa, *J. Nikai,* no. 1316; Yasui mura, prov. Tosa, *S. Yano.*

Panax japonicum f. **dichrocarpum** Nakai, comb. nov.

Panax quinquefolia b. *japonica* cc. fructibus apice nigris Siebold in Verh. Batav. Genoot. XII. no. 1, 45 (Syn. Pl. Oecon. Jap.)(1830).

Panax Ginseng var. *japonicum* f. *dichrocarpum* Makino in Tokyo Bot. Mag. XXIV. 224, excl. syn. (1910).

Folia ut typica. Bacca coccinea apice nigra.

HONDO: in silvis montis Takaosan, prov. Musashi, *T. Nakai.*

Panax japonicum f. **xanthocarpum** Nakai, comb. nov.

Panax quinquefolia b. *japonica* cc. fructibus flavis, Siebold in Verh. Batav. Genoot. XII. 45 (Syn. Pl. Oecon. Jap.) (1830).

Panax Ginseng var. *japonicum* f. *xanthocarpum* Makino in Tokyo Bot. Mag. XXIV. 224 (1910).

Folia ut typica. Fructus flavus.

In montibus Japonicis crescere dicitur sed mihi adhuc ignotum.

Maximowicz used a new name *Panax repens* for this species citing the following reason.

"Nomen *P. japonicum* C. A. Mey., *P. quinquefolia* var. *japonicae* Siebold superstructi, delendum, quia specimen Sieboldii unicum, a botanico Japonensi Keiske datum, verosimiliter nil nisi exemplar monstrosum *P. Ginseng,* qualia aegre a Japonensibus conservantur, radix vero, certe seorsim a Sieboldio reportata, quia omnino non mos est Japonensium, radices una cum reliqua planta exsiccare,

praesertim si molis tam est incommodae, et praeterea, quia a Miquelio, qui spec. auth. examinata, sub silentio praeteriter, nostro *P. repenti* desumta est." (See Mél. Biol. VI. 266–267 [1867]).

C. A. Meyer remarks:

"Erst v. Siebold, dem wir so viel für die Kenntniss Japan's zu verdanken haben, machte auf die Verschiedenheit dieser Pflanzen, sowie des japanischen Ginschen, aufmerksam, und Fr. Nees von Esenbeck sah sich veranlasst, zwei Arten anzunehmen, den amerikanischen *Panax quinquefolius* und den asiatischen *P. Schinseng;* diese letztere Art umfasst, nach des Verfassers Ansicht, den mandshurisch-chinesischen und den japanishen Ginschen, so wie den nepalischen *P. Pseudo-ginseng.*" (See Bull. Phys.-Math. Acad. Sci. St. Pétersb. I. 339 [1824]).

Though Meyer's name *Panax japonicum* might possibly have been derived from Siebold's *Panax quinquefolium* b. *japonicum*, his description is based entirely on the figure of Nees, since he says "Plantam non vidi, sed ex icone speciem omnino distinctam esse credo," and Siebold did not have a figure, while Nees von Esenbeck published an excellent colored plate in his Icones Plantarum Medicinalium. According to Meyer's description "rhizomate repente, fibris lateralibus fusiformibus; squama decidua ad basin caulis; foliolis 5 oblongis acuminatis profunde serratis" the plant cannot be any other than this species. Eliminating the synonym *P. quinquefolium* b. *japonicum* Siebold, the name *P. japonicum* becomes the correct name for this species and *Panax repens* becomes its synonym. So far as I know there is no yellow-fruited *Panax Ginseng.* I think Siebold made his note from memory and mistook *Panax japonicum* and his specimen of *Panax schin-seng* for the same species.

Panax schin-seng Nees, Icon. Pl. Med. suppl. fasc. 5, t. 16 A–A3, d, e, f excl. var. 2 and 3 (1833).

Panax quinquefolia a. *coreensis* Siebold in Verh. Batav. Genoots. XII. 45 (Syn. Pl. Oecon. Jap.) (1830); nom. nud.

P. quinquefolia b. *japonica* Siebold l. c., fide Maximowicz.

Panax Ginseng C. A. Meyer in Bull. Acad. St. Pétersb. sér. 2, I. 340 (1843).—Walpers, Rep. V. 924 (1846).—Franchet & Savatier, Enum. Pl. Jap. I. 192 in nota sub *P. repens* (1875).—Seemann in Jour. Bot. II. 320 (1864); IV. 54 (1868).—Harms in Engler & Prantl, Nat. Pflanzanfam. III. abt. 8, 59, fig. 10 & 11 (1867); in Bot. Jahrb. XXIII. 10 (1897).—Palibin in Act. Hort. Petrop. XVII. 100 (Consp. Fl. Kor. I.) (1898).—Komarov in Act. Hort. Petrop. XXV. 126 (Fl. Mansh. III.) (1907).—Makino in Iinuma, Somokudzusetsu, rev. ed. 319 (1907).—Nakai, Fl. Kor. I. 279 (1909).

Panax quinquefolium var. *Ginseng* Regel & Maack apud Regel in Gartenfl. XI. 314, t. 375, fig. a-d, f, i, k (1862).

Aralia quinquefolia var. *Ginseng,* Guide to Kew Museum, no. I. 87 (1886), fide Burkill in Kew Bull. Misc. Inf. 1902, 6.

Panax schin-seng var. **coraiense** Nees, Icon. Pl. Med. suppl. fasc. 5, sub. t. 16 (1833). (1833), "var. *Coraiensis.*" Of this variety two forms may be distinguished.

Panax schin-seng var. **coraiense** f. **spontaneum** Nakai, forma nova.

Rhizoma plus minus cylindrice elongatum.

In silvis Koreae sept. et mediae rarum.

Panax schin-seng var. **coraiense** f. **cultum** Nakai, f. nova.

Rhizoma brevissimum.

In agris Japonicis et Koreanis colitur.

Although *Panax Ginseng* C. A. Meyer is the best name for the Korean Ginseng, *P. schin-seng* precedes it by ten years. *Panax schin-seng* has three varieties of which two belong really to two distinct species. When a species is subdivided into varieties by an author such as a, b, c or 1, 2, 3 or giving names of their own and the co-ordinate descriptions are followed it is natural to adopt the first variety for the type. *Panax schin-seng* is one of these cases and moreover it is furnished with colored plates which no one can mistake for any other species. This is the reason why the name *Panax schin-seng* is adopted here.

The author started this investigation at the Tokyo Imperial University and finished it at the Arnold Arboretum of Harvard University. He wishes to express his great appreciation of Professor Sargent's courtesy in allowing him to avail himself freely of the library and the herbarium of that institution. The author wishes also to thank Mr. E. H. Wilson for useful help and to Miss Tucker for her courteous assistance in the library. And he wishes especially to emphasize his sense of gratitude toward Mr. Rehder for his valuable criticisms and suggestions.

EHRETIAE QUAEDAM NOVÆ ASIATICAE

T. Nakai

"The Chinese specimens [of *Ehretia acuminata*] agree well with Bentham's full description of Brown's species, and in the absence of Australian material of the typical plant there is nothing to be done but to follow Clarke and others in referring the Asiatic plant to Brown's species. Nevertheless, I am sceptical as to the two being conspecific, since such distribution is contrary to all we know of Chinese woody plants."

This is a note by Mr. E. H. Wilson when he enumerated the Chinese *Ehretia* in Sargent's Plantae Wilsonianae. Agreeing in this opinion I have lately studied all the material of *Ehretia acuminata* and of the allied species in the Arnold Arboretum Herbarium. Fortunately I have been able to see both flowering and fruiting specimens of *Ehretia acuminata* from Australia and of the related species. They are indeed closely related but have some remarkable distinctive characters. The most important character distinguishing *E. acuminata* from allied species is the shape of the anthers. In *E. acuminata* they are roundish and the connective is not produced while in the other species they are oblong and the connective exceeds the anther-tips. Next to the shape of the anthers, the pubescence and the persistence of the leaves, the color and nature of the fruits are prominent characters of the group. According to these characters the species may be distinguished as follows:—

Folia subtus pubescentia vel pilosa.

Folia supra glabra, subtus pubescentia, ovata vel ovato-rotundata, remote et minute serrulata, basi rotundata. Fructus maturi rubri.....*E. pilosula.*

Folia supra scaberulo-pilosella, subtus pilosella vel subglabra, oblonga vel oblongo-obovata, per totam longitudinem serrulata, basi rotundata vel acuta vel subcordata. Fructus maturi ignoti.....*E. polyantha.*
Folia subtus praeter axillas venarum glaberrima.
Antherae rotundatae vel late ovatae, connectivo loculos antherae non superante.
Ramulus biennis rubro-fuscescens. Folia lanceolato-acuminata vel ovato-acuminata. Fructus rubri.
Folia margine per totam longitudinem minute serrulata.
E. acuminata.
Folia margine remote serrulata interdum subintegra.
E. acuminata var. *laxiflora.*
Antherae oblongo-ovatae vel oblongae apiculatae. Ramulus biennis fuscus vel cinereo-fuscescens. Folia lanceolato-acuminata vel ovato- vel elliptico-acuminata.
Folia hieme decidua minute serrulata vel subcrenulato-serrata. Fructus aurei v. aurantiaci.
Folia vulgo obovata interdum elliptica, vulgo utrinque attenuata.
E. thyrsiflora.
Folia vulgo elliptica, crenulato-serrata.....*E. thyrsiflora* var. *latifolia.*
Folia per hiemem persistentes. Fructus aurantiaci vel rubri.
Fructus maturi aurantiaci, non edules. Folia oblonga vel anguste oblonga, apice mucronata vel acuminata, crenato-serrata, adulta utrinque glabra, basi acuta vel rotundata vel truncata.....*E. taiwaniana.*
Fructus maturi rubri, edules.
Folia lanceolata vel oblongo-lanceolata basi acuta v. acuminata, aequaliter serrulata.....*E. serrata.*
Folia ovata vel elliptica, subirregulariter serrulata, basi rotundata vel acuta.....*E. serrata* var. *pyrifolia.*

Ehretia pilosula F. Mueller in Fragm. Phytogr. Austral. v. fasc. XXXIV. 20 (1865).

AUSTRALIA.

Specimen non vidi.

Ehretia polyantha A. de Candolle, Prodr. IX 503 (1845).
Ehretia virgata Blanco, Fl. Filip. 127 (1837), non Swartz.
Ehretia Onava A. de Candolle Prodr. IX. 511 (1845).
Ehretia acuminata Vidal y Soler, Rev. Pl. Vasc. Filip 193 (1886).—Robinson in Philipp. Journ. Sci. IV. 690 (Philipp. Borag.) (1909).—Merrill, Spec. Blanc. 328 (1918).

PHILIPPINE ISLANDS: (Mindanao, Luzon, Negro Isl.).

This is an evergreen tree flowering from October to March, the fruits ripening from May to June. The leaves are comparatively large among the species of this group and are very often subcordate at base. The inflorescence is large and always scabrous.

Ehretia acuminata R. Brown, Prodr. Fl. Nov. Holland. 497 (1810).—A. de Candolle, Prodr. IX. 503 (1845).—Bentham, Fl. Austral. IV. 387 (1869).—F. Mueller, Fragm. Phytogr. Austral. IX. 122 (1875).—Betche, Handb. Fl. New South Wales, 362 (1893).—M. Bailey, Queensl. Fl. IV. 1038 (1901), excl. syn. *E. serrata.*

AUSTRALIA.

Ehretia acuminata var. **laxiflora** Bentham Fl. Austral. IV. 388 (1869).—M. Bailey, Queensl. Fl. IV. 1038 (1901).

AUSTRALIA.

This is nearest to *Ehretia serrata*, but the color of the twigs is different. I saw specimens[1] taken from a tree cultivated in the Botanic Garden, at Buitenzorg, Java. It seems different from either *E. serrata* or *E. acuminata*, but the material is not sufficient to decide this. According to F. Mueller (l. c.) the leaves of *E. acuminata* are deciduous, but I think this is a mistake. The flowering specimens in the Arnold Arboretum Herbarium were collected in the garden of Palace Grounds of Sydney in April and the fruiting specimen on the Blackall Range in January. They show that the flowers appear in autumn and fruit ripens in summer, the leaves remaining through the winter.

Ehretia thyrsiflora Nakai, Trees Shrubs Jap. I. 327, fig. 179 (1922); Fl. Sylv. Kor. XIV. 20, t. 4 (1923).

Ehretia serrata β. *obovata* Lindley in Bot. Reg. XIII. nota sub tab. 1097 (1827).

Cordia thyrsiflora Siebold & Zuccarini in Abh. Akad. Muench. IV. pt. III. 150 (Fl. Jap. Fam. Nat. II. 26) (1846).

Ehretia serrata Franchet & Savatier, Enum. Pl. Jap. I. 333 (1875); non Roxburgh.

Ehretia acuminata Hemsley in Jour. Linn. Soc. XXVI. 143 (Ind. Pl. Sin.) (1890), pro parte.—Diels in Bot. Jahrb. XXIX. 545 (Fl. Centr. China) (1900).—Pampanini in Nuov. Giorn. Bot. Ital. n. ser. XVII. 699 (1910).—Wilson in Sargent, Pl. Wilson. III. 362 (1916), pro parte.—Non R. Brown.

Ehretia ovalifolia Hasskarl, Cat. Hort. Bogor. 137 (1844); non Wight.

Ehretia acuminata v. *grandifolia* Pampanini, Nuov. Giorn. Bot. Ital. n. ser. XVII. 699 (1910).

KYUSHU: Osumi province: circa Kirishima, *R. Yatabe*.

FORMOSA: Takou, (*A. Henry*, no. 1135).

CHINA. Shangtung: Yen Miao, *J. Hers*, no. 1924. Honan: monte Yii Tai Shan, *J. Hers*, no. 282. Hupeh: Ichang, *E. H. Wilson*, no. 74; Hsing-Shan-Hsien, *E. H. Wilson*, no. 74A; Changyang Hsien, *E. H. Wilson*, no. 819, 1103; sine loco, *A. Henry*, no. 6358. Kiangsu: Huang Tsang Yii, *J. Hers*, no. 1001. Hunan: inter urbes Tsingtschon et Wukang, *H. Handel-Mazzetti*, no. 340. Yunnan: Szemao, *A. Henry*, no. 10545.

J. Hers no. 1924 agrees with Pampanini's variety *grandifolia*, which is based on a vigorous branch of a young tree.

Ehretia thyrsiflora var. **latifolia** Nakai, Trees Shrubs Jap. I. 329 (1922).

Folia elliptica crenulato-serrata.

KYUSHU: in monte Sobosan, *H. Sakurai*.

This is a distinct variety found only in the northern part of Kyushu and in western Hondo.

Ehretia taiwaniana Nakai, sp. nov.

Ehretia acuminata Hemsley in Jour. Linn. Soc. XXVI. 144 (Ind. Fl. Sin.) (1890), pro parte.—Henry in Trans. Asiat. Soc. Jap. XXIV. suppl. 62 (List Pl. Formosa) (1896).—Matsumura in Tokyo Bot. Mag. XII. 83 (1898).—Matsumura & Hayata, Enum. Pl. Formos. 253 (1906).—Matsumura, Ind. Pl. Jap. II. pt. II. 524 (1912), pro parte.—Dunn & Tutcher, Fl. Kwangtung 177 (1912).—Gagnepain & Courchet in Lecomte, Fl. Gén. Indo-chine, IV. 209 (1914).—Wilson in Sargent, Pl. Wilson. III. 363 (1916), pro parte.—Kanehira, Formos. Trees, 381 (1918).—Non R. Brown.

[1] Vide *Ehretia acuminata* Koorders & Valeton, Boomsort. Java, VII. 74 (1900), et *Ehretia serrata* Koorders, Excursionsfl. Java, III. 127 (1912).

Arbor mediocris. Cortex trunci griseus, longitudine fissus. Folia et inflorescentia juvenilia saepe pilosa sed demum glabrescentia; ramuli glabri teretes, biennes, grisei vel fusco-grisei. Petioli glabri, 7–30 mm. longi, supra canaliculati, virides; lamina nutans, oblonga v. elliptica, apice acuta vel mucronata vel attenuata, basi acuta vel rotundata vel subcordata, 2–14.5 cm. longa, 0.7–7.5 cm. lata, subcoriacea, supra glabra vel sparsissime scaberulo-ciliata secus venas primarias adpresse ciliata, margine crenulato-serrata vel interdum subintegra vel subduplicato-serrata. Inflorescentia erecta terminalis thyrsoidea, basi nuda vel foliosa, 3–20 cm. longa, ramis primo pilosis sed glabrescentibus; flores densi sessiles vel brevissime pedicellati, suaveolentes; calyx 5-lobus, lobis 1.5 mm. longis orbicularibus vel ovato-orbicularibus margine ciliolatis; corolla alba, tubo incluso vel subexserto, lobis oblongis obtusis reflexis 2–3 mm. longis; stamina exserta; antherae ovato-oblongae, albae, apiculatae; styli apice bifidi. Bacca parva sphaerica, aurantiaca, inedulis; pyrenae 1–2.

Formosa: Bankinsing, *A. Henry*, nos. 506, 443; Takow, *A. Henry*, nos. 1874, 1778, 1778a; South Cape, *A. Henry*, nos. 952, 922; in silvis Maruyama, *U. Faurie*, no. 303; in silvis Paehiran, *U. Faurie*, no. 302; Pinan, *E. H. Wilson*, no. 11133.

Liukiu: Naha insulae Okinawa, *E. H. Wilson*, no. 8018.

China. Kwangtung: circa Canton, *C. O. Levine*, no. 446. Yunnan: via Peyentsin ad Tatienkai, *Siméon Ten*, no. 310. Kwangsi: Ta Yu Hsien, *H. H. Hu*, no. 964. Hupeh: Ma-pan-sciah, 1000 m., *C. Silvestri*, no. 1919.

This is a subtropical evergreen tree. It is the subject of Wilson's photograph no. 3307.

Ehretia serrata Roxburgh, Hort. Bengal. 17 (1814), nom. nud.; Fl. Ind. ed. Carey, II. 340 (1824); Fl. Ind. ed. 2, I. 596 (1832).—Lindley in Bot. Reg. XIII. t. 1097 (1827).—A. de Candolle, Prodr. IX. 503 (1845).—Brandis, Forest Fl. Ind. 339 (1874).—S. Kurz, Forest Fl. Brit. Burma II. 210 (1877).—Gamble, List 37 (1878); Man. Ind. Timbers, 272 (1881).

Ehretia acuminata C. B. Clarke in Hooker f. Fl. Brit. Ind. IV. 141 (1883) excl. syn. *E. ovalifolia* et *Cordia thyrsiflora*.—Brandis, Ind. Trees, 481 (1906).—Kanjilal, Forest Fl. Siwalik et Jaunsar, 296 (1911). Gamble, Man. Ind. Timbers, ed. 2, II. 503 (1922).

Himalaya, Khasia, Bengal, Chittagong, Upper Burma.

Ehretia serrata var. **pyrifolia** A. de Candolle, Prodr. IX. 503 (1845).

Ehretia pyrifolia D. Don, Prodr. Fl. Nepal. 102 (1825).

Bengal et Nepal.

This also is an evergreen tree. The flowers appear from March to June; the fruits ripen from May to November.

Ehretia Dicksoni Hance in Ann. Sci. Nat. sér. 4, XVIII. 224 (1862).

Ehretia macrophylla Hemsley in Jour. Linn. Soc. XXVI. 145. (Ind. Fl. Sin.) (1890).—Henry in Trans. Asiat. Soc. Jap. XXIV. suppl. 62. (List Fl. Formosa) (1896).—Matsumura in Tokyo Bot. Mag. XII. 83 (1898).—Diels in Bot. Jahrb. XXIX. 545 (1900).—Matsumura & Hayata in Jour. Coll. Sci. Tokyo XXII. 254 (Enum. Pl. Formos.) (1906).—Pampanini in Nuov. Giorn. Bot. Ital. n. ser. XVII. 699 (1910).—Bean, Trees Shrubs Brit. Isl. I. 504 (1914).—Wilson in Sargent, Pl. Wils. III. 364 (1916), pro parte, excl. syn. *Ehretia corylifolia*.—Non Wallich.

Haec species ab *E. macrophylla* floribus corymbosim dispositis dignoscenda.

Ehretia Dicksoni has been often mistaken for *E. macrophylla* from which it differs in its racemosely arranged flowers on the branchlets of the inflorescence. Mr. E. H. Wilson tells me he is now of the opinion that *Ehretia Dicksoni* is distinct from the Himalayan *E. macrophylla*. He saw many plants of *E. Dicksoni* in Paris where it is quite hardy and flowers and fruits freely and is considered a good tree to plant in streets where small trees are desired. *Ehretia Dicksoni* is a variable plant and its varieties may be distinguished as follows.

Folia subtus tota petiolisque velutina, late elliptica vel ovata vel ovato-rotundata.
  Inflorescentia velutina. Corolla extus griseo-ciliata.....*E. Dicksoni* var. *tomentosa*.
Folia subtus saltem ad costae basin et petiolum pilosa vel glabra.
  Folia subtus distincte velutina.
    Folia subtus praeter basin costae velutina.....*E. Dicksoni* var. *liukiuensis*.
    Folia subtus ad costam et venas primarias glabra...*E. Dicksoni* var. *japonica*.
  Folia subtus adpresse pubescens vel subglabra.
    Folia subtus adpresse pubescentia.....*E. Dicksoni* var. *typica*.
    Folia subtus subglabra.....*E. Dicksoni* var. *glabrescens*.

Ehretia Dicksoni var. **typica** Nakai.

Folia late ovata vel obovata vel oblongo-obovata vel oblonga, apice acuta vel obtusa, basi acuta vel rotundata vel subcordata, supra scabra, infra molliter sparsim pubescentia. Inflorescentia sparsim pilosella. Corollae lobi extus glabri vel piloselli.

China. Kiangsu: Nanking, *F. N. Meyer*, no. 1415. Honan: Yii Tai shan, *J. Hers*, no. 275; Cheng Chow, *J. Hers*, no. 69. Kiangsi: prope Kuling, *E. H. Wilson*, no. 1571. Hupeh: Outanscian, *C. Silvestri*, no. 1925; Ichang, *E. H. Wilson*, nos. 3554A et 84; San-scien, *C. Silvestri*, no. 1923. Szechuan: sine loco speciali, *C. Bock & A. v. Rosthorn*, no. 2364.

Formosa: Takow, *A. Henry*, no. 313; South Cape, *A. Henry*, no. 323; Bankingsing, *A. Henry*, sine numero; Tentana, *E. H. Wilson*, no. 10306.

Ehretia Dicksoni var. **glabrescens** Nakai, var. nov.

Ehretia macrophylla Wilson in Sargent, Pl. Wilson III. 364 (1916), pro parte; non Wallich.

Folia subtus praeter venas primarias sparsissime pilosellas glabra. Rami inflorescentiae glabri; corolla extus glabra.

China. Hupeh: Ichang, *E. H. Wilson*, nos. 3554, 3554B. Yunnan: Mengtze, *A. Henry*, no. 10515.

Ehretia Dicksoni var. **liukiuensis** Nakai, var. nov.

Folia rotundato-obovata vel subrotundata supra scabra, subtus velutina, costa basin versus glabra excepta. Inflorescentia pubescens; corolla extus adpresse pilosa.

Liukiu: sine loco speciali (a Yokohama Nursery Co. commun.).

Ehretia Dicksoni var. **japonica** Nakai, var. nov.

Ehretia macrophylla Matsumura Ind. Pl. Jap. II. pt. II. 524 (1912), pro parte, planta Formosana excl.—Nakai, Trees, Shrubs Jap. I. 329, f. 180 (1922).

Folia subrotundata vel late elliptica, supra distincte scabra, subtus adpresse velutina, costis et venis primariis glabris. Inflorescentia sparsim pilosa; corolla extus glabra.

HONDO. Awa province: in monte Kiyozumi, *H. Sakurai.*

SHIKOKU. Awa province, Kaifu, *J. Nikai.*

Ehretia Dicksoni var. **tomentosa** Nakai, var. nov.

Ehretia macrophylla var. *tomentosa* Gagnepain & Courchet in Lecomte, Fl. Gén. Indo-Chine, IV. 212 (1914).

Folia rotundato-ovata vel late oblonga vel subrotundata, apice acuta, basi acuta vel rotundata vel subcordata, supra scabra, infra toto velutina. Inflorescentia velutina; corolla extus lanato-pilosa.

CHINA. Hainan, *Ford,* sine no.; Hoi how (comm. Hort. Bot. Hongkong, no. 2183).

Ehretia corylifolia *C. H. Wright* (in Kew Bull. Misc. Inform. 1896, 25) a specie praecedente perdistincta foliis basi vulgo cordatis ovato-acuminatis utrinque tenuiter pubescentibus, serrulis parvis, floribus corymboso-scorpioidibus. In Yunnan vulgaris.

NOTES ON NORTH AMERICAN TREES, XII[1]

C. S. SARGENT

Aesculus glabra var. **monticola,** n. var.

Differing from the type in its dwarf habit, small fruit and often 7 leaflets.

Leaves 5–7, usually 5-foliate, their petioles glabrous, 7–15 cm. in length; leaflets oblong-obovate to elliptic, abruptly or gradually narrowed and long-pointed at apex, cuneate at base, coarsely often doubly serrate with acuminate teeth, glabrous with the exception of a few short hairs early in the season on the upper side of the midrib and principal veins, 10–12 cm. long and 4.5–5 cm. wide, their petiolules glabrous or sparingly pilose, 1–10 mm. in length. Flowers rather smaller but otherwise as in the type. Fruit subglobose, 1.5–2 cm. in diameter, usually 1-seeded; seeds subglobose or depressed and often nearly twice as broad as high, dark chestnut brown and marked by an oval or nearly circular hilum 6–7 mm. long.

A shrub 1–2 m. tall.

OKLAHOMA: La Flore County, northern slopes near the top of Rich Mountain at an altitude of 500 m. near Page, *E. J. Palmer,* no. 20967 (type), April 27, 1922, no. 21634, June 1, 1922, (with shorter, broader and more coarsely serrate leaflets, slightly scabrate above and more pubescent on the upper side of the midrib and veins and furnished below with small tufts of pale axillary hairs) and October 8, 1922, (fruit only).

From *Aesculus glabra* var. *micrantha* Sargent, the shrubby variety from Fulton, Arkansas, the Oklahoma shrub differs in its more pubescent

[1] For part XI, see vol. IV,

leaflets and much larger flowers. In the number of leaflets and in their shape and serratum it is nearer to the var. *Buckleyi* Sarg. than to the type.

× **Aesculus arnoldiana** (*A. glabra* × *A. hybrida*), n. hyb.

Leaves 5-foliolate, their petioles deeply grooved on the upper side, puberulous toward the apex, 8–15 cm. in length; leaflets elliptic, long-pointed and acuminate at apex, cuneate at base, finely, often doubly serrate, sparingly floccose-pubescent early in the season becoming glabrous or nearly glabrous above, pubescent along the under side of the midrib and of the from fifteen to twenty pairs of primary veins furnished in their axils with conspicuous tufts of pale hairs, dull dark green on the upper surface, pale yellow-green on the lower surface, 9–14 cm. long and 4–5 cm. wide; petiolules pubescent or puberulous, 5–10 mm. in length. Flowers mostly unisexual by abortion of the ovary, yellow, opening the end of May, on slender pubescent pedicels, in short broad densely flowered clusters, pubescent like the short peduncle; calyx campanulate, slightly pubescent; petals villose and glandular on the margin, those of the upper pair marked with red; stamens nearly as long or slightly longer than the petals, sparingly, villose. Fruit roughened by the scattered prickles and occasional by their bases, subglobose, 2–3 cm. in diameter, 1–3-seeded; seeds light chestnut-brown, up to 2 cm. in diameter, hilum 5–6 mm. in diameter.

This tree which sprung up several years ago in the Aesculus Group of the Arboretum in the immediate neighborhood of flowering plants of its supposed parents is a tree from 6.5 to 7 m. high with a slender trunk covered with pale scaly bark. In general appearance it might be taken for a plant of *A. glabra* from which it differs in the shorter stamens, smaller only slightly roughened fruit and in the presence of glands mixed with the hairs on the margin of the petals showing the influence of one of the Eupaviae. None of the species of this group had flowered in the Arboretum when the seed which produced this tree germinated and the glands on the margin of the petals can only be accounted for by the influence of *A. hybrida* D. C., a hybrid it is believed between *A. Hippocastanum* and *A. Pavia*, one of the red-flowered Eupaviae.

Aesculus octandra var. **vestita**, n. var.

Differing from the type in the coating of pale tomentum or pubescence on the lower surface of the leaflets and on the petioles and branchlets. This form of the yellow flowered Buckeye which is widely distributed with the species appears to be more abundant westward than on the southern Appalachain Mountains where *Aesculus octandra* grows to its largest size and is most abundant.

In the herbarium of this Arboretum are the following specimens of this variety:

NORTH CAROLINA. Roan Mt., *Gray, Sargent, Redfield* and *Canby*, June 19, 1879; Buncombe County, Craggy Mt., *T. G. Harbison*, Sept. 7, 1906.

West Virginia. Mercer County, near Princeton, *T. G. Harbison*, September 7, 1906; Munroe County, Sweet Springs, *C. S. Sargent*, August 13, 1910; Greenbriar County, White Sulphur Springs, *J. S. Ames*, May 17, 1919.

Kentucky. Greenup County, Russell, no. 1566, October 2, 1922, May 2, 1923; Breathitt County, Portsmouth, no. 828, May 8, 1919; South Portsmouth, no. 828, May 8, 1919; Pike County, Pikeville, no. 947 (type), May 17, 1919, no. 1251, October 2, 1920; Boyd County, Ashland, no. 834, May 9, 1919, September 31, 1920; Lee County, Beatyville, no. 1145, May 20, 1920; Letchen County, Jenkins, 1315, September 24, 1921; all by *R. E. Horsey*.

Ohio. Scioto County, Portsmouth, *R. E. Horsey*, no. 460, September 21, 1915 and May 21, 1916.

Indiana. Crawford County, near Leavenworth, *C. C. Deam*, no. 18613, September 4, 1915; Dearborn, near Aurora, *C. C. Deam*, no. 16052, June 17, 1915.

Among cultivated plants the *Aesculus neglecta* Baenitz (Herb. Dendr. without number "Breslau: Goepperthain, 1903"), not Lindley, and Hort. Goettingen, *A. Rehder*, no. 1571, belong to this variety.

It has been cultivated in the Arboretum since 1898 when a plant was received from the Meehan Nursery at Germantown, Penn. (no. 8121); in 1900 a plant was received from the Spaeth Nursery at Berlin, Germany (no. 8123); and in 1907 the seeds collected on Craggy Mountain, North Carolina, by T. G. Harbison, produced a number of plants (no. 13276).

The covering of the lower surface of the leaflets of the tree from Pikeville, Kentucky, (Horsey no. 947), is distinctly tomentose, and similar tomentum occurs on several of the other specimens in this herbarium. On other specimens the lower surface of the leaflets is pubescent, sometimes only slightly so, showing the transition to the normal form of *Aesculus octandra* in which the lower surface of the leaflets is glabrous or occasionally slightly pubescent early in the season with deciduous hairs except along the under side of the midrib and principal veins. The amount of the pubescence on the petioles and branchlets also varies in different individuals.

Aesculus neglecta Lindley in Bot. Reg. xii. t. 1009 (1826).—Spach in Ann. Sci. Nat. sér. 2, ii. 55 (1834).

Lindley's description of this species was made from a tree growing in the garden of the London Horticultural Society at Chiswick, which had been purchased from a Monsieur Catros of Bordeaux under the name *Aesculus ohioensis*. Spach took up Lindley's name and spoke of the tree as common in cultivation in 1834. Koehne in 1893 (Deutsche Dendr. 386) suggested that it was a hybrid of *A. discolor* and *A. octandra*, but the margins of the petals in Lindley's excellent plate show no trace of the glands among the hairs which indicate hybrid origin in Aesculus. The petals are pale yellow marked by small red blotches.

I have never seen a wild Buckeye with flowers which resemble those figured by Lindley, but Colonel Henry A. du Pont of Winterthur, Delaware, has recently called my attention to two trees planted by his grandfather the leaves and flowers of which cannot be distinguished from those represented by Lindley's plate.

Eleuthère Irénée du Pont de Nemours, the founder of the Dupont Family in America, came from France in 1800 to America where he lived first at Hackensack, New Jersey, but in July 1802 moved to Delaware where he established his powder works and built a substantial stone mansion on the banks of the Brandywine in Christiana Hundred, about four miles from Wilmington at the place which has now for one hundred and twenty-one years been known as Eleutherean Mills.

A family tradition, preserved by the now oldest Du Pont who as a boy gathered nuts from the trees, records the fact that Mr. Antoine Bidermann who had married Du Pont's second daughter Evelina and had become associated with him in the powder business had gone to New Orleans some time after 1820 to inspect there the agency of the powder mills and had returned home on horseback through Mississippi, Alabama and Georgia, and that during this journey he had picked up the nuts from which the Eleutherean Mills trees had grown.

The soil on the steep slope in the rear of the Du Pont mansion is deep and rich, as is shown by the size and vigor of the native Oak-trees which are growing in it, and the two large Buckeyes on this slope, the trees which in the color of their flowers so closely resemble the flowers of Lindley's plate, are 32 and 28 metres high with a trunk girth at 3 feet from the ground of 2.35 and of 2.10 metres. The larger of these two trees is the tallest and largest Buckeye of any variety of which authentic measurements have been made.

The conclusion which an examination of these Eleutherean Mills Buckeyes has forced on me is that there are no real characters by which the plant I have named *Aesculus georgiana* can be distinguished from the *Aesculus neglecta* of Lindley which, if this view is accepted, becomes the type of the species of the Octandrae which in various forms is widely distributed in the Piedmont region of North and South Carolina and northern Georgia, occasionally ascending the Blue Ridge in North Carolina to altitudes of 3000 feet, and is common in central Georgia, ranging east into Richmond County and south into northern and central Alabama, and to an isolated station near Pensacola in Florida.

It varies from a tree 17 or 20 metres tall to a shrub which flowers and produces abundant fruit when not more than 1 metre high. The leaflets of the type and of one variety are glabrous on the lower surface, but in one form they are pubescent, and on another densely tomentose. The flowers of *A. neglecta* are borne in elongated slender clusters, but in the plants now considered its varieties the flower-clusters are often short and crowded and the petals are yellow, more or less marked with red or entirely red.

I have not seen specimens of wild trees which exactly resemble the type of *A. neglecta* as represented in Lindley's plate and by the two large trees at Eleutherean Mills, but three specimens presented to the Arboretum herbarium by Mr. W. W. Ashe resemble the type in their narrow elongated flower clusters and in the size and shape of the yellow flowers which, however, are without the red markings of those of the type; these specimens can perhaps be referred to *A. neglecta* rather than to any of its varieties. Mr. Ashe's specimens are labeled "Aesculus sp. nov. Alamance County, N. C., near Saxapahaw, about June 1, 1900, W. W. Ashe;" "*A.* sp. nov. near Williamsville, Dunham County, N. C., May 13, 1904, and *Aesculus* sp. nov., Chapel Hill, N. C., April 20, 1915, sent me by Dr. Coker at my request from tree on the Hillsboro road, W. W. Ashe."

The more distinct forms of *Aesculus neglecta* may be arranged as follows:

Aesculus neglecta Lindley. Leaflets glabrous on the lower surface; flowers in elongated rather open clusters; petals pale yellow or nearly white, marked by small red blotches.

Aesculus neglecta var. **georgiana,** n. var.

Aesculus georgiana Sargent in Trees and Shrubs, II. 359, t. 197 (1913); Man. Trees N. Am. ed. 2, 706, f. 635 (1922).

Differing from the type in the shorter, broader and more densely flowered corymbs; in the typical form calyx red on the upper side and pale yellow on the lower side; petals bright yellow, passing into forms with entirely red or yellow flowers.

Usually a low broad shrub, occasionally a tree from 14 to 20 metres in height.

The type station for this variety is in De Kalb County, Georgia, near the base of Stone Mountain; it ranges northward in Georgia to the northern border of the state and is very abundant in Banks, Rabun and Habersham Counties; it occurs in Seneca and Oconee Counties, South Carolina, T. G. Harbison, no. 1, May 15, 1915, and nos. 7 and 9, April 9, 1918, and ranges northward in the Piedmont region to Durham County, North Carolina, T. G. Harbison, no. 6, April 22, 1918. It is the form which has been found in Alabama by C. Mohr, Madison Co., Mt. Sano, September 26, 1881, "large tree 80–85 feet high;" Tuscaloosa County, Tuscaloosa, rocky banks of the Warrior River, and in Eltowah County, Attalla, by T. G. Harbison, nos. 198, 209, October 8, 1910, "low shrub." It is this form with yellow flowers which occurs in western Florida near Pensacola growing as a small shrub, T. G. Harbison, April 11, 1915, March 21, 1916.

Aesculus neglecta var. **pubescens,** nov. comb.

A. georgiana var. *pubescens* Sargent in Trees and Shrubs, II. 259 (1913); Man. Trees N. Am. ed. 2, 706 (1922).

Differing from the type and from the var. *georgiana* in the pubescence covering the lower surface of the leaflets.

The type of this variety was raised at the Arboretum in 1905 from seeds collected by T. G. Harbison in De Kalb County, Georgia, near the base of Stone Mountain.

The following specimens in the Arboretum herbarium collected by T. G. Harbison are referred to this variety:

NORTH CAROLINA. Wake County, Raleigh, no. 7, April 21, 1918; Orange County, May 31, 1919; Macon County, Highlands, June 5, 1916.

SOUTH CAROLINA. Oconee County, Seneca, nos. 11, 6084, 6087, April 9, 1918, and April 29, 1922.

GEORGIA. Rabun County, no. 23, May 11, 1919, Clayton, May 10, 1914; Richmond County, near Augusta, *C. S. Sargent*, March 10, 1908, April 7 and 28, 1914; *T. G. Harbison*, no. 6081, April 28, 1912, nos. 1534, 1535, 1538, 1540, May 5, 1914, no. 6, October 5, 1914; De Kalb County, near Stone Mountain, *T. G. Harbison*, no. 661, September 7, 1911, nos. 905, 906, 907, April 30, 1912.

ALABAMA. Etowah County, Attalla, no. 200, October 8, 1910.

Aesculus neglecta var. tomentosa, n. var.

Differing from the type and from its vars. *georgiana* and *pubescens* in the thick coat of tomentum on the lower surface of the leaflets.

SOUTH CAROLINA. Oconee County, *T. G. Harbison*, nos. 6088, 6090, 6091, 6092, 6093, 6094, 6095, 6096, 6098, 6101, 6102, 6106, 6107, 6108, April 30, 1922.

This variety is an old inhabitant of European gardens where it has been cultivated as *Aesculus Michauxii* Hort., not Spach, *A. Lyonii* Hort., not Loudon, *A. discolor* Hort., not Pursh, *A. humilis* Hort., not Lindley, *Pavia discolor* in Herb. Kew Arb. 1010, not Pursh, *Pavia rubra* in Herb. Kew Arb. 3158, *A. rubra carnea superba*, Hort. Ellwanger & Barry, *A. rubra carnea pubescens*, Hort. Ellwanger & Barry.

Aesculus neglecta var. lanceolata, n. comb.

Aesculus georgiana var. *lanceolata* Sargent in Jour. Arnold Arb. II. 120 (1920); Man. Trees N. Am. ed. 2, 707, f. 636 (1921).

Differing from the type in the lanceolate to slightly oblanceolate long pointed leaflets.

A single tree from 25 to 30 feet in height, with bright red flowers. Rich woods, near Clayton, Rabun Co., Georgia, *T. G. Harbison*, no. 19, May 9, 1917.

× **Aesculus Du Pontii** (*Aesculus neglecta* × *Pavia*), new hyb.

Leaves 5-foliolate, their petioles slender, glabrous, 8–14 cm. in length; leaflets oblong-obovate to elliptic, abruptly long-pointed at apex, gradually narrowed to the cuneate base, acutely serrate, glabrous with the exception of tufts of pale hairs in the axils of the 18–25 pairs of slender veins, dark green on the upper surface, pale yellow-green on the lower surface, 15–19 cm. long and 5–8 cm. wide, with a thin yellow midrib; petiolules slender, glabrous, 5–10 mm. in length. Flowers appearing the middle of May up to 2 cm. in length, on slightly villose pedicels in narrow pubescent clusters 10–12 cm. in length; calyx narrow campanulate, red, eglandular, glabrous

or slightly villose at the base, petals yellow or yellow slightly tinged with red, their margins glandular and villose.

A tree 29.15 metres in height, with a trunk 2.25 metres in girth at one metre above the ground, covered with scaly bark, stout yellow branchlets and pale brown winter buds 2 cm. long.

This tree was planted by the fence near the right hand side (facing the house) of the entrance to Eleutherean Mills after 1820 by Eleuthère Irénée du Pont de Nemours and probably sprang from one of the seeds collected by Antoine Bidermann during his journey on horseback from New Orleans. This Buckeye, which is one of the most interesting of the trees which have been planted in the United States, may well preserve among tree lovers the name of a family which in at least four generations has made the neighborhood of Wilmington, Delaware, one of the chief centres of horticulture in the United States.

× **Aesculus DuPontii** var. **Hessei** (*A. neglecta georgiana* × *Pavia*), n. hybr.

Leaves 5-foliolate, their petioles stout, puberulous early in the season, 7–15 cm. in length; leaflets elliptic to slightly obovate, gradually narrowed and long-pointed at apex, cuneate at base, usually doubly serrate with slender slightly incurved teeth, glabrous, dark green above, lighter and yellow-green below, 10–13 cm. long and 4–5 cm. wide, with a prominent yellow midrib and from 20–25 pairs of slender primary veins often furnished with small tufts of axillary hairs; petiolules puberulous, 3–9 mm. long. Flowers appearing late in May, up to 3 cm. in length, red or yellow tinged with red, on short villose pedicels in compact densely crowded villose clusters 12 or 13 cm. long; calyx narrow-campanulate, slightly villose toward the apex, usually red, the petals yellow more or less tinged with red, villose and glandular on the margin.

This shrub was presented to this Arboretum in 1909 by the Hesse Nursery at Weener, Germany, with two other hybrid Buckeyes, under the name of *Aesculus* (*Pavia*) *nana rosea* "de semis." The presence of both hairs and glands on the margin of the petals indicates its hybrid origin. The leaves cannot be distinguished from those of *Aesculus Pavia*, while the inflorescence and the flowers only differ from those of *A. neglecta georgiana* in the rather narrower calyx and in the glands on the margin of the petals.

× **Aesculus mutabilis** Schelle in Beissner, Schelle & Zabel, Handb. Laubholz.-Ben. 323 (1903) = *A. discolor mollis* × *neglecta georgiana*.

Pavia mutabilis Spach in Ann. Sci. Nat. sér. 2, II. 57 (1834).
Aesculus discolor × *lutea* Koehne, Deutsch. Dendr. 386 (1893).
Aesculus Pavia mutabilis Hort. Spaeth.

This tree was well described by Spach, although the pubescence along the sides of the under surface of the midrib and in a lesser degree of the veins of the leaflets of the Arboretum plants presented by the Spaeth Nursery at Berlin, Germany, are not tomentosae on the veins as Spach de-

scribed it but villose. He failed, however, to notice the glands scattered among the hairs on the margin of the petals which indicate that it is a hybrid between a species of the Eupaviae and one of the Octandrae.

× **Aesculus mutabilis** var. **penduliflora** (*A. discolor mollis* × *neglecta*), n. hyb.

Leaves 5-foliolate, their petioles glabrous, 10–16 cm. long; leaflets oblong-lanceolate, acuminate and long-pointed at apex, gradually narrowed and cuneate at base, finely serrate with gland-tipped teeth, dark green and glabrous except on the midrib and veins above, pale and soft pubescent below, 12–16 cm. long, 4–5 cm. wide, with 22 or 24 pairs of primary veins; petiolules pubescent, 7–10 mm. in length. Flowers opening early in June, on slender glandular pedicels 5–10 mm. long, in narrow slightly pendent sparsely flowered densely pubescent clusters 14–16 cm. in length; calyx tubular, reddish covered with red glands, 5–6 mm. in diameter; corolla yellow, glandular, the margin of the petals covered with hairs mixed with glands. Fruit nearly globose, smooth with a thin pericarp; seed subglobose, dark chestnut brown and lustrous, 2–2.5 cm. in diameter, the hilum oblong or oval, 8–10 mm. in length.

As it grows in this Arboretum this is a narrow slender tree now about 8 metres in height, with a trunk 25 cm. in diameter covered with thin dark brown scaly bark; it was presented to the Arboretum in 1902 by the Spaeth Nursery near Berlin, Germany, under the name of *Aesculus humilis* × *lutea*.

The shape of the leaflets and the elongated flower clusters point to the typical form of *A. neglecta*, while the pubescence on the lower surface of the leaflets and the color of the flowers suggest that *A. discolor mollis* may have been the other parent. The long narrow leaflets and the elongated and pendent clusters of brilliant flowers make this one of the most distinct and beautiful of the hybrid Buckeyes.

× **Aesculus mutabilis** var. **induta** (*A. discolor mollis* × *neglecta*), n. hyb.

Differing from the type in the pale tomentum covering through the season the lower surface of the leaflets.

This variety is based on two of the three plants presented in 1909 to the Arboretum by the Hesse Nursery in Weener, Germany, as *Aesculus* (*Pavia*) *rosea nana* "de semis." It is probably the *Aesculus neglecta* Baenitz (Herb. Dendr. without number "Breslau: Südpark, 1905"), not Lindley. It was cultivated in 1904 in this Arboretum under the name of *A. octandra hybrida* (No. 1636–2) now dead.

CORRECTION

In the second edition of the Manual of the Trees of North America, 806 (December 1921), the Marlberry, a small tree of extreme southern Florida, was transferred from the genus Icacorea to Ardisia and called *A. paniculata* Nuttall. Nuttall, however, never made such a combination,

which must be credited to Sargent. The name, moreover, is not a valid one, having been used for another plant in 1814 by Roxburgh. The correct name for the Florida tree appears to be *Ardisia escallonioides* Chamisso & Schlechtendal in Linnaea, VI. 393 (1831). (See C. Mez, Myrsinaceae in Engler, Pflanzenr. IV.-236, 81 [1902]).

NEW SPECIES, VARIETIES AND COMBINATIONS FROM THE HERBARIUM AND THE COLLECTIONS OF THE ARNOLD ARBORETUM[1]

ALFRED REHDER

Xolisma Raf.

Xolisma Rafinesque in Am. Month. Mag. IV. 193 (1819).—Britton in Mem. Torrey Bot. Club, IV. 135 (1894).—Britton & Brown, Ill. Fl. U. S. Can. II. 569 (1897).—Small, Fl. S. E. U. S. 889 (1903); in N. Am. Fl. XXIX. 65 (1914).

Andromeda Linnaeus, Spec. 393 (1753), in part.

Lyonia Nuttall, Gen. I. 266 (1818).—Sprengel, Syst. II. 291 (1825).—Endlicher, Gen. 755 (1836–40).—De Candolle, Prodr. VII. pt. II. 599 (1839).—Bentham & Hooker, Gen. Pl. II. 587 (1876).—Drude in Engler & Prantl, Nat. Pflanzenfam. IV. 1, 44 (1889).—Fernald & Robinson in Gray's New Man. ed. 7, 635 (1908).—Not Rafinesque (1808), nor Elliott (1817).

In 1819 Rafinesque proposed the name Xolisma for Lyonia of Nuttall for the reason that the name Lyonia had been given by him in 1808 (in Med. Rep. N. Y. v. 353) to another genus, but that name was only a new name to replace Polygonella Michaux, which Rafinesque considered inappropriate; therefore it is not a valid name and will remain a synonym of Polygonella. There is, however, another Lyonia proposed in 1817 by Elliott (Sketch Bot. S. C. I. 316 [1817]) which antedates Lyonia of Nuttall and is a valid name for a new genus based on *Ceropegia palustris* Pursh (*Cynanchum angustifolium* Muhlb.); later the same genus was named Seutera by Reichenbach (Consp. 131 [1828]) and this name is taken up by Small, as according to the Philadelphia Code Lyonia Elliott is invalidated by the older homonym Lyonia Rafinesque of 1808, but according to the International Rules the latter name is not valid and therefore Lyonia Elliott remains the oldest and valid name for the genus of Asclepiadaceae, which makes it necessary to take up for Lyonia Nuttall the next oldest name which is Xolisma. The type species of this genus is *Lyonia ferruginea* Nuttall in which the character of the thickened sutures of the valves is most pronounced and the thickened part separates from the rest of the capsule, while in other species as in *X. ligustrina*, *X. mariana*, *X. lucida* and *X. ovalifolia* the thickened part, though clearly perceptible by its light color is apt to separate more irregularly from the rest of the valves and does not hold together so firmly like a separate valve as it does in *X.*

[1] Continued from vol. IV. p. 253.

ferruginea and its nearest relations. *Xolisma mariana*, *X. lucida* and *X. ovalifolia* have been referred by Bentham and Hooker and other authors to the genus Pieris, but they differ from that genus not only in the thickened sutures of the capsule, but also in the awnless anthers; apparently these authors did not consider the structure of the capsule and did not distinguish between appendaged or awned anthers and the appendaged filaments of these species; they considered the appendages of the filaments as equal in taxonomic importance to the awns of the anthers, but the former constitute a less constant character and the appendages may become more or less indistinct or obsolete and are entirely absent in some species of Xolisma as in *X. villosa*, while the awned anthers constitute a constant and important character.

Xolisma ligustrina Britt. var. **pubescens** Millspaugh, Liv. Fl. W. Virginia, 324 (1913).

Andromeda paniculata var. 2. *foliosiflora A. floribus subtomentosis* Michaux, Fl. Am.-Bor I. 255 (1803).
Andromeda tomentosa Dumont de Courset, Bot. Cult. ed. 2, III. 495 (1811).
Andromeda frondosa Pursh, Fl. Am. Sept. 295 (1814).
Lyonia frondosa Nuttall, Gen. I. 267 (1818).
Andromeda ligustrina var. *pubescens* A. Gray, Syn. Fl. N. Am. II. pt. I. 33 (1878),
? *Andromeda paniculata* var. *tomentosa* Dippel, l. c., in part.
Lyonia ligustrina var. *pubescens* Bean, Trees Shrubs Brit. Isles, II. 64 (1914).—Rehder in Bailey, Stand. Cycl. Hort. IV. 1935 (1915).
Arsenococcus frondosus Small, Shrubs Fla. 97 (1913); in N. Am. Fl. XXIX. 72 (1914), in part.

This variety is nearest to *X. ligustrina foliosiflora* C. Mohr, which in its typical form has nearly glabrous leaves lustrous above and usually a more leafy inflorescence with a nearly glabrous corolla (*Andromeda paniculata* var. 2, *foliosiflora* A. *floribus glabellis* Michaux, Fl. Am.-Bor. I. 255 [1803]), while the variety has the leaves grayish above from a dense covering of short appressed hairs, becoming glabrescent at maturity, loosely or sparingly villose on the surface beneath and densely villose on the midrib and on the prominent veins; the inflorescence is usually less leafy and the corolla densely hairy with short stiff hairs except at the base. The specimen in this herbarium which shows these characters most markedly is from a cultivated plant collected by H. Zabel in the Botanic Garden at Muenden, Germany; this plant had been received in 1871 from the Booth Nursery at Flottbeck, Germany, under the name *Andromeda tomentosa* and is no doubt the plant described by Dumont de Courset under that name; by Kirchner (in Petzold & Kirchner, Arb. Musc. 468 [1864]) it was erroneously referred to *Xerobotrys tomentosa* Nuttall (= *Arctostaphylos tomentosa* Lindl.)

Xolisma lucida, comb. nov.

Andromeda lucida, Lamarck, Encycl. Méth. I. 157 (1783).
Andromeda nitida Bartram apud Marshall, Arb. Am. 8 (1785).—Gray, Syn. Fl. N. Am. II. pt. I. 32 (1878).
Andromeda coriacea Aiton, Hort. Kew. II. 70 (1789).—Sims in Bot. Mag. XXVIII. t. 1095 (1808).

Andromeda mariana Jacquin, Icon. Pl. Rar. III. t. 465 (1790), excl. synon.; not Linnaeus.
Andromeda myrtifolia Salisbury, Prodr. 290 (1796).
Andromeda marginata Veillard in Nouv. Duham. I. 188, t. 40 (1802).
Lyonia marginata D. Don in Edinb. New Philos. Jour. XVII. 159 (1834).
Leucothoe coriacea De Candolle, Prodr. VII. pt. II. 602 (1839), excl. synon.
Leucothoe marginata Spach, Hist. Vég. IX. 482 (1840).
Andromeda lacustris C. Wright in Sauvage, Anal. Acad. Ci. Habana, VI. 250 (1870).
Lyonia lucida K. Koch, Dendr. II. 118 (1872).—Blake in Rhodora, XVII. 132 (1915).
Pieris nitida Bentham & Hooker; Gen. Fl. II. 588 (1876).—Britton in Britton & Brown, Ill. Fl. II. 569, fig. 2769 (1897).
Andromeda obovata Rafinesque ex Gray, Syn. Fl. N. Am. II. pt. I. (1878), as synon.
Lyonia nitida Fernald in Rhodora, X. 53 (1908).—Robinson & Fernald, Gray's N. Man. 635 (1908).
Neopieris nitida Britton in Britton & Brown, Ill. Fl. ed. 2, II. 690 (1913).
Desmothamnus nitidus Small, Shrubs Fla. 96 (1913); in N. Am. Fl. XXIX. 64 (1914).
Pieris lucida Rehder in Mitteil. Deutsch. Dendr. Ges. XXIV. 226 (1915), not Léveillé (1906).

This species which is native to the coastal plain from Virginia to Florida and Louisiana and is also found in Cuba has been made by Small the type of the new genus Desmothamnus chiefly distinguished from typical Xolisma by the appendaged filaments and the pair of intra-marginal veins of its leaves, but the absence or presence of teeth or appendages near the apex of the filament does not seem to be a strong morphological character, and in some species these appendages though present become obsolete; it therefore does not seem wise to use this character for generic distinction.

Xolisma mariana, comb. nov.

Andromeda mariana Linnaeus, Spec. 393 (1753).—Gray, Man. 266 (1848); Syn. Fl. N. Am. II. pt. I, 32 (1878).
Andromeda pulchella Salisbury, Prodr. 289 (1796).
Andromeda mariana α. ovalis Sims in Bot. Mag. XXXVII. t. 1579 (1813).
Andromeda mariana β. oblonga Sims, l. c. sub t. 1579 (1813).
Lyonia mariana D. Don in Edinb. N. Philos. Jour. XVII. 159 (1834).—Robinson & Fernald, Gray's N. Man. 635 (1908).
Leucothoe mariana De Candolle, Prodr. VII. pt. II. 602 (1839).
Pieris mariana Bentham & Hooker, Gen. Pl. II. 588 (1876).—Britton in Britton & Brown, Ill. Fl. II. 569, fig. 2770 (1897).
Neopieris mariana Britton in Britton & Brown, Ill. Fl. ed. 2, II. 691 (1913).—Small in N. Am. Fl. XXIX. 65 (1914).

This species which is distributed from Rhode Island to Florida, Tennessee, Arkansas and eastern Texas has been made by Britton the type of the new genus Neopieris distinguished chiefly by the appendaged stamens a character which seems to be, as I have remarked under the preceding species, not of sufficient importance for generic distinction.

Xolisma mariana f. vestita, forma nov.

Recedit a typo ramulis annotinis, sepalis, foliis subtus satis dense villosis foliis supra sparsius sed ad costam et venas densius breviter villosis, pedicellis sparsius villosis.

TEXAS: Sandy Pine lands, Silsbee, Hardin County, *E. J. Palmer*, no. 9561, April 25, 1916 (type); Angelina County, *J. Reverchon*, no. 3863, May 5, 1903 (distributed as *Vaccinium corymbosum*).

This form is easily distinguished from the type by the soft pubescence of all its parts except the corolla; the leaves of the type specimen are generally elliptic-oblong and from 4 to 6.5 cm. long and 1.3 to 3 cm. wide. The branchlets, calyx and leaves of the typical form are glabrous or sometimes the midrib and veins on the under side of the leaves are slightly or rarely rather densely villous and the calyx is sometimes sparingly hairy, but none of the numerous specimens seen from the whole range of the species approach this new form in its densely villose pubescence. I have seen no other material of *X. mariana* from Texas and I find no record of its range extending as far west; the most western specimens seen are from Jefferson and Pulaski Counties in southeastern and central Arkansas (*E. J. Palmer*, nos. 8481 and 22999).

Xolisma ovalifolia, comb. nov.

Andromeda ovalifolia Wallich in As. Research, XIII. 391, fig. (1820); Cat. No. 763 (1828).—D. Don, Prodr. Fl. Nepal. 148 (1825).—Wight, Icon. IV. t. 1199 (1850).

Pieris ovalifolia D. Don in Edinb. Phil. Jour. XVII. 159 (1834).—De Candolle, Prodr. VII. pt. II. 599 (1839).—Clarke in Hooker, Fl. Brit. Ind. III. 460 (1882).—Rehder & Wilson in Sargent, Pl. Wilson. I. 552 (1913).

Lyonia ovalifolia Drude in Engler & Prantl, Nat. Pflanzenfam. IV. abt. I. 44 (1889).

Pieris pilosa Komatsu in Matsumura, Icon. Pl. Koisikav. III. 73, t. 182 (1916).

This species differs from the preceding in its lateral and occasionally terminal elongated racemes usually with a few leafy bracts near the base. In its typical form it inhabits the Himalayas from Kashmir to Bhutan and extends to Assam, Khasia and British Burma and to southwestern China, and Formosa.

Xolisma ovalifolia var. lanceolata, comb. nov.

Andromeda lanceolata Wallich in As. Research, XIII. 390, fig. (1820).—Wight, Icon. IV. t. 1198 (1850).

Andromeda squamulosa D. Don, Prodr. Fl. Nepal. 149 (1825).

Pieris lanceolata D. Don in Edinb. Phil. Jour. XVII. 159 (1834)—De Candolle, Prodr. VII. pt. II. 599 (1839).—Hance in Jour. Bot. XVI. 12 (1878).

Pieris ovalifolia var. *lanceolata* Clarke in Hooker f., Fl. Brit. Ind. III. 461 (1882).—Hemsley in Jour. Linn. Soc. XXVI. 17 (1889).—Rehder & Wilson in Sargent, Pl. Wilson. I. 552 (1913).

Pieris formosana Komatsu in Matsumura, Icon. Pl. Koisikav. III. 71, t. 181 (1916).

This variety differs chiefly in the narrower leaves, usually broadly cuneate at base or sometimes rounded and in the longer and narrower greenish sepals. It seems to have about the same range as the type.

Xolisma ovalifolia var. elliptica, comb. nov.

Andromeda elliptica Siebold & Zuccarini in Abh. Akad. Munch. IV. pt. III. 126 (Fl. Jap. Fam. Nat. II. 2) (1846).—Schneider, Ill. Handb. Laubholzk. II. 532, fig. 346 p-r, 347 e-g (1911).

Andromeda ovalifolia Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 30 (1863).—Maximowicz in Bull. Acad. Sci. St. Pétersb. XVIII. 50 (1872); in Mél. Biol. VII. 620 (1872).—Non Wallich.

Pieris ovalifolia Hemsley in Jour. Linn. Soc. xxvi. 17 (1889), in part.—Diels in Bot. Jahrb. xxix. 515 (1900).—Shirasawa, Icon. Ess. For. Jap. ii. t. 60 (1910).—Non Don.

Lyonia ovalifolia Pampanini in Nuov. Giorn. Bot. Ital. n. ser. xvii. 683 (1910); non Drude.

Pieris ovalifolia var. *elliptica* Rehder & Wilson in Sargent, Pl. Wilson. i. 552 (1913).

Pieris elliptica Nakai in Tokyo Bot. Mag. xxxiii. 207 (1919); Trees Shrubs Jap. i. 149, fig. 87 (1922).

This variety differs chiefly in its thinner leaves and smaller fruits (3–4 mm. in diameter) from the type which has coriaceous leaves and larger fruits 4–5 mm. in diameter; none of the other characters given by Siebold & Zuccarini to distinguish the Japanese plant from that of the Himalayas holds. This variety is widely distributed through China except in the northern provinces and is also common in central and southern Japan.

Xolisma villosa, comb. nov.

Andromeda villosa Wall. Cat. No. 762 (1828), nomen nudum.

Pieris villosa Hooker f. apud Clarke in Hooker f., Fl. Brit. Ind. iii. 461 (1882).—Dunn in Jour. Linn. Soc. xxxix. 476 (1911).—Rehder & Wilson in Sargent, Pl. Wilson. i. 553 (1913).

? *Pieris Henryi* Léveillé in Bull. Soc. Bot. France liii. 204 (1906); in Fedde, Rep. Spec. Nov. iii. 262 (1906).

This species is very similar in general appearance and in most of its characters to the preceding species but is easily distinguished by the pubescence on the under side of the leaves, by the shorter inflorescence, by the lanceolate longer calyx-lobes divided nearly to the base and by the absence of the appendages of the filaments. It occurs at altitudes of from 3000–4000 m. on the Himalayas from Ghurwal to Sikkim and also in western China as far north as western Szechuan. Judging from the description I have little doubt that Léveillé's *Pieris Henryi* belongs here.

Xolisma villosa var. pubescens, comb. nov.

Pieris ovalifolia var. *pubescens* Franchet in Nouv. Arch. Mus. Paris, sér. 2, x. 44 (Pl. David. ii. 82) (1887).

Pieris villosa var. *pubescens* Rehder & Wilson in Sargent, Pl. Wilson. i. 554 (1913).

This variety differs from the type in its pubescent ovary and is known only from western Szechuan.

Xolisma compta, comb. nov.

Pieris compta W. W. Smith & J. F. Jeffrey in Not. Bot. Gard. Edinb. ix. 116 (1916).

Of this species I have not seen the type but a specimen collected in the Yunnan Fu district by O. Schoch (No. 145) and determined as *P. compta* by Schneider agrees well with the original description except that the calyx-lobes are ovate and obtuse rather than ovate-lanceolate and acutish and the ovary is ovoid and not depressed globose; the longest leaves of Schoch's specimen are up to 3.5 cm. long and the minute dots of the under side are not black. The general appearance of the plant suggests a species belonging in the affinity of *X. ovalifolia* and an examination of the stamens confirms this opinion; the anthers are without awns or appendages, not

biaristate as described by the authors, but the filaments have near the apex back of the anther-cells a pair of appendages in shape and size like those of *P. ovalifolia*. Of *Pieris bracteata* W. W. Smith I have seen no specimens but from the statement "filamentis . . . apice biaristatis" I infer that it also belongs to Xolisma. *Pieris Forrestii* Craib is a true Pieris and so is *P. polita* W. W. Smith & J. F. Jeffrey to which I refer one of Dunn's specimens collected in Fokien (Hongkong Herb. No. 2894). Of the numerous species of Pieris proposed by Léveillé I have seen no material and his descriptions are too incomplete to be guided by them. But I may say that *P. Bodinieri* appears to be a true Pieris judging from his drawing (in his Cat. Pl. Seutchouen, t. 24 [1918]) and that his *P. Henryi* probably belongs to *Xolisma villosa;* some of his species may not belong to the Andromedeae at all, but to Vaccinium as his *P. coreana* and *P. Fauriei* which according to Dr. Nakai who has seen the type specimens are both *Vaccinium bracteatum*, or they belong to other Ericaceous genera.

The species of Xolisma may be divided into several well marked groups as follows:

Xolisma Raf.

Sect. I. LYONIA, comb. nov.

Andromeda Walter, Fl. Car. 137 (1788), as to *A. ferruginea.*
Lyonia Nuttall, Gen. I. 266 (1818), in part; not Rafinesque (1808) nor Elliott (1817).
Xolisma Rafinesque in Am. Month. Mag. IV. 193 (1819).
Lyonia sect. 1. Bentham & Hooker, Gen. Pl. II. 588 (1876).
Andromeda sect. 5. *Lyonia* Gray, Syn. Fl. II. pt. I. 32 (1878).
Lyonia Subgen. 3. *Eulyonia* K. Koch, Dendr. II. pt. I. 119 (1872), in part.—Drude in Engler & Prantl, Nat. Pflanzenfam. IV. abt. I. 44 (1889).

This section, the type of which is *Lyonia ferruginea* Nuttall = *X. ferruginea* A. Heller, is characterized by the flowers being borne in dense axillary panicles, by the unappendaged filaments and the lepidote indumentum; the leaves are persistent and often toothed or undulate; the capsule is usually ovoid, prominently angled and the thickened part of the sutures separates as a whole from the rest of the capsule. Its many species (24 being enumerated by Small in N. Am. Fl. XXIX. 65–72), are mostly natives of the West Indies; two occurring in the southeastern United States and a few in Mexico.

Sect. II. ARSENOCOCCUS, sect. nov.

Vaccinium Linnaeus, Spec. 351 (1753), as to *V. ligustrinum.*
Andromeda Lamarck, Encycl. Méth. I. 158 (1883), as to *A. racemosa.*
Lyonia Nuttall, Gen. I. 266 (1818). in part, excl. species typica.
Andromeda sect. *Lyonia* Gray, Man. 265 (1848); Syn. Fl. II. pt. I. 32 (1878), in part.
Lyonia Subgen. *Eulyonia* K. Koch, Dendr. II. pt. I. 119 (1872), in part.
Lyonia sect. 2. Bentham & Hooker, Gen. Pl. 588 (1876).
Arsenococcus Small in Small & Carter, Fl. Lancaster Co. 218 (1913).

This section, the type of which is *Vaccinium ligustrinum* L. = *X. ligustrina* Rehd., is characterized chiefly by its flowers being borne in terminal panicles, by the unappendaged filaments, the absence of the lepidote indumentum, by the depressed-globose capsule not prominently angled and

with less thickened sutures; the leaves are deciduous and glabrous or pubescent. This section contains only one variable species native to the eastern States of North America distributed from Maine to Florida and Louisiana. The sectional names Lyonia and Eulyonia cannot be used, as these sections do not contain the type of Lyonia which is *L. ferruginea* G. Don and belongs to the preceding section.

Sect. III. MARIA, comb. nov.

Andromeda Linnaeus, Spec. 393 (1753), in part.
Lyonia D. Don in Edinb. N. Phil. Jour. XVII. 159 (1834), in part.
Leucothoe sect. II. *Maria* De Candolle, Prodr. VII. 602 (1839).
Andromeda § *Maria* Gray, Man. 266 (1848).
Andromeda § *Pieris* Gray, Man. ed. 2, 254 (1856).
Lyonia subgen. *Pieris* K. Koch, Dendr. II. pt. I. 116 (1872), excl. *L. pulverulenta*.
Pieris sect.4 *Maria* Bentham & Hooker, Gen. Pl. II. 588 (1876).
Lyonia Untergatt. V. *Maria* Drude in Engler & Prantl, Nat. Pflanzenfam. IV. abt. I. 44 (1889).
Neopieris Britton in Britton & Brown, Ill. Fl. ed. 2, II. 690 (1913).
Desmothamnus Small, Shrubs Florida, 96 (1913).

This section, the type of which is *Andromeda mariana* L. = *X. mariana* Rehd., is chiefly characterized by the flowers borne in axillary clusters on the branches of the previous season, by the appendaged filaments, the ovoid or globose-ovoid capsule with prominently thickened sutures; the leaves are entire, persistent or deciduous and glabrous, rarely puberulous or pubescent. The two species are native of eastern North America and are distributed from Rhode Island to Florida and Louisiana; one of the species is also found in Cuba.

Sect. IV. PIERIDOPSIS, nom. nov.

Andromeda Wallich in As. Research. XII. 391 (1820).
Pieris D. Don in Edinb. New Philos. Jour. XVII. 159 (1834), as to *P. ovalifolia*.
Pieris sect. *Eupieris* Bentham & Hooker, Gen. Pl. II. 588 (1876).
Lyonia subgen. *Pieris* Drude in Engler & Prantl, Nat. Pflanzenfam. IV. abt. I. 44 (1889).

This section, the type of which is *Pieris ovalifolia* (Wall.) Don = *X. ovalifolia* Rehd., is characterized by the flowers borne in axillary and terminal on-sieded usually elongated racemes, by the less strongly thickened sutures and the usually appendaged filaments (without appendages in *X. villosa* Rehd.); the leaves are entire, persistent or deciduous and glabrous or more or less pubescent. The species of this section are all Asiatic and distributed from Kashmir through the Himalayas to western and eastern China, to central and southern Japan and to Formosa. The sectional names Pieris and Eupieris cannot be used, as they do not contain the type species of Pieris which is *P. formosa* Don and belongs to a distinct genus.

Andromeda glaucophylla f. latifolia, comb. nov.

Andromeda polifolia α. *latifolia* Aiton, Hort. Kew. II. 68 (1789).—Pursh, Fl. Am. Sept. I. 291 (1814), as β. *latifolia*.—Loddiges, Bot. Cab. VI. t. 546 (1821).

This variety differs in its oblong or narrow-oblong less revolute leaves from the type which has linear or linear-oblong leaves. Link's description of his *A. glaucophylla* is apparently based on a plant cultivated in the Botanic Garden at Berlin and as he describes his species as with "foliis linearibus," the narrow-leaved form must be considered the type. The citation of Pursh's *A. polifolia* β. as a synonym does not necessarily indicate as Fernald assumes (in Rhodora, XVIII. 100 [1916]) that Link based his species on Pursh's variety, for in this case Link is describing a plant cultivated in the Berlin Botanic Garden and that plant of which possibly specimens are preserved in the Berlin herbarium is to be considered the type. Considering the specific name I fully agree with Professor Fernald that *A. glaucophylla* Link is the same plant as *A. canescens* Small which has to be referred as a synonym to it, and that it is not identical with *A. polifolia* as Small (in N. Am. Fl. XXIX. 61 [1914]) has it.

× **Erica Mackaii** Hook. var. **Watsonii**, comb. nov.

Erica ciliaris subsp. * *Watsoni* Bentham in De Candolle, Prodr. VII. 665 (1838).
Erica ciliaris β. *Watsoni* K. Koch, Hort. Dendr. 329 (1853).
Erica Tetralix β. *Watsoni* Babington, Man. Brit. Fl., ed. 4, 214 (1856).
Erica Tetralici-ciliaris Syme, Engl. Bot. VI. 39, t. 888 (1866).
Erica Watsoni Macfarlane in Trans. R. Soc. Edinb. XXXVIII. 237 (1895).—Chevalier in Monde Pl. VI. 53 (1896); VII. 193 (1897); in Bull. Herb. Boissier, VI. apx. IV. 10 (1898).—Neyrant in Act. Soc. Linn. Bordeaux, LV. Compt. Rend. 160 (1900).—Schneider, Ill. Handb. Laubholzk. II. 566 (1911).—Bean, Trees Shrubs Brit. Isles, I. 520 (1914).

As there can be hardly any doubt that *Erica Watsoni* and *E. Mackaii* are both hybrids between *E. ciliaris* L. and *E. Tetralix*, they should be united under the oldest binomial designation which is *E. Mackaii* Hook., and *E. Watsoni* which differs from typical *E. Mackaii* chiefly in its racemose inflorescence and the longer corolla with oblique mouth may be distinguished as a variety.

Vaccinium japonicum Miq. var. **sinicum**, comb. nov.

Oxycoccoides japonicus var. *sinica* Nakai, Trees Shrubs Jap. I. 168 (1922), descriptione in lingua japonica tantum.

A typo recedit foliis ovato-oblongis vel oblongo-lanceolatis basi late cuneatis vel rotundatis subtus basin versis ad et secus costam ut petiolus villosis interdum glabris vel fere glabris, filamentis supra medium pilosis.

CHINA. Kweichou: Tchuenning-shan, near Kweiyang, alt. 1100-1250 m., *H. Handel-Mazzetti*, no. 10522 (type) July 1, 1917. Szechuan: Wen chuan hsien, alt. 1500–2000 m., *E. H. Wilson*, no. 971, October, 1908; north Wushan, *A. Henry*, no. 643. Hupeh: Chang yang hsien, alt. 1300 m., *E. H. Wilson*, no. 244, October, 1907; without precise locality, *E. H. Wilson*, no. 1621, August, 1900, *A. Henry*, no. 6021.

The Chinese specimens enumerated above all differ in their smaller much narrower leaves never cordate or subcordate at the base, as they often are in the Japanese type in which, moreover, the petioles and the leaves are always quite glabrous. In its pilose filaments and its narrow leaves the variety resembles *V. japonicum* var. *lasiostemon* Hayata (Icon.

Pl. Formos. II. 115, t. 12 [1912]) from Formosa, but the leaves of the Formosan variety are quite glabrous according to the description. Dr. Nakai has proposed for *V. japonicum* Miq. and *V. erythrocarpum* Michx. the new genus Oxycoccoides (in Tokyo Bot. Mag. XXXI. 246 [1917]), but in doing so he overlooked the fact that Small in 1903 (in his Fl. S. E. U. S. 896, 1336) based the new genus Hugeria on *V. erythrocarpum* and as the two species are undoubtedly congeneric differing only in minor characters, the oldest name for this genus, if separated from Vaccinium or from Oxycoccus, will be Hugeria Small. The name Oxycoccoides proposed by Bentham & Hooker (Gen. Pl. II. 574 [1876]) as a section of Vaccinium though older than Hugeria, cannot invalidate a properly published generic name.

Viburnum molle f. leiophyllum, forma nova.

A typo recedit foliis subtus glabris axillis venarum barbatis exceptis vel interdum ad venas sparse pilosis.

MISSOURI: Stone County, Galena, high limestone bluffs, James River, *E. J. Palmer*, no. 5671, May 20, 1914 (type), no. 4671, October 15, 1913 and no. 17226, April 17, 1920, no. 22816, May 23, 1923, no. 23872*a*, September 24, 1923. Taney County, Swan, cliffs of the Swan River, *C. S. Sargent*, October 8, 1899, *B. F. Bush*, no. 798, October 9, 1899 (Gray Herb.), no. 3449, September 26, 1905. MacDonald County, Noel, *B. F. Bush*, nos. 5531, 5763, April 25, and May 27, 1909. Benton County, Cole Camp Creek, *Wm. Trelease*, no. 4, May 19, 1904.

CULTIVATED: Arnold Arboretum under no. 4643: August 29, 1913, June 9, 1910, February 15, June 27 and September 20, 1917, December 23, 1918, June 7, 1921.

This form differs only in the glabrous or nearly glabrous under side of the leaves from typical *V. molle* Michx. which has the leaves densely soft pubescent beneath.

An intermediate form represents a specimen of the co-type of *V. Demetrionis* Deane & Robins., a synonym of *V. molle*, from the Cole Camp Creek, Benton County, in the Herbarium of the Arnold Arboretum, the leaves of which are very sparingly pubescent with mostly forked hairs beneath, except the veins which are more densely pilose with mostly simple hairs; other specimens from the same locality have the leaves densely pubescent beneath as in the typical form, while Trelease's No. 4 cited above has nearly glabrous leaves. Of the type there are specimens from the following localities in the Arnold Arboretum Herbarium: Danville, Kentucky (type locality), Benton County (type locality of *V. Demetrionis* Deane & Robins.), Christian, Stone and Boone Counties, Missouri, and Carroll and Ripley Counties, Indiana. This shows that from two localities, Cole Camp Creek, Benton County and Galena, Stone County, Missouri, both forms are represented and that the glabrescent form seems to occur only in the western part of the range of the species.

The variety bears some resemblance to *V. affine* Bush, but that species may be distinguished by the light brown or grayish brown, not light gray or light grayish yellow, color of the branchlets, the close bark of older

branches, the smaller ovate or elliptic-ovate, not orbicular-ovate leaves rounded or only slightly cordate at base and by the shorter petioles only 0.6–1.2 cm. or rarely up to 1.5 cm. long.

Viburnum pubescens var. **Deamii,** var. nov.

A typo recedit foliis majoribus orbiculari-ovatis brevissime abrupte acuminatis interdum ovatis vel ovato-ellipticis, rarius obovatis eis turionum interdum ovato-oblongis supra accumbenti-pilosis subtus tota facie molliter laxeque in nervis densius et longius fasciculato-pilosis, nervis utrinque 9–11 praeditis, petiolis saepe stipulis subulatis instructis supra tantum densius pubescentibus subtus sparsius vel glabrescentibus, pedunculis ramulisque novellis glabris vel fere glabris.—Frutex 3 m. altus; folia basi truncata vel rotundata, rarius late cuneata, 5–9 cm. longa et 4.5–9 cm. lata vel angustiora tenuiter membranacea, dentibus latissime triangularibus utrinque 15–20, petiolis 1–2.5 cm. longis; pedunculus 5–9 cm. longus.

INDIANA: Brown County, deep wooded ravine about 2 miles southeast of Helmsburg, *C. C. Deam,* no. 11148, June 16, 1912 and no. 12217, August 25, 1912 (type). Jefferson County, in a Liquidambar woods 6 miles north of Madison, *C. C. Deam,* no. 18848, September 9, 1915. Spencer County, base of wooded slope 3 miles south of St. Meinard, *C. C. Deam,* no. 16541, June 28, 1915; Sweet Gum and Pin Oak woods 1½ miles northeast of lake, *C. C. Deam,* no. 37505, August 10, 1922, nos. 39951, 39952, October 2, 1923; on crest of a low ridge 1½ miles north of Helmsburg, *C. C. Deam,* no. 38950, July 4, 1923. Jackson County, top of slope about ¾ mile southwest of Chestnut Ridge, *C. C. Deam,* no. 38619, June 18, 1923. Jennings County, roadside, 2.7 to 3 miles south of San Jacinto, *C. C. Deam,* nos. 38595, 38598, no. 38878, June 16, 1923. Switzerland County, flat low woods about 1 mile southeast of Fairview, *C. C. Deam,* no. 40040, October 13, 1923.

The presence of stipules on many of the petioles of the variety suggests affinity to *V. affine* Bush and *V. molle* Michx., but both these species have a very different fruit with a much flattened stone showing two lateral grooves on the ventral side, while this variety agrees exactly in its fruit with the type of *V. pubescens* Pursh (*V. venosum* Britt.) which has a globose conical or short ellipsoidal scarcely or slightly compressed stone with a deep groove in the middle of the ventral side. In typical *V. pubescens* and in its varieties, var. *Canbyi* Blake and var. *longifolium* Blake, the petioles are almost always without stipules, but may be occasionally stipulate on any of these three varieties, therefore it does not seem advisable to consider the greater or lesser prevalence of stipules a character of sufficient value to separate this and the following variety specifically from *V. pubescens.* In the size and shape of its leaves, at least in its typical form, var. *Deamii* has some resemblance to *V. molle,* but in that species the leaves are distinctly cordate at base, the branchlets are light gray or light grayish yellow and the bark on older branches separates in thin flakes. It also resembles *V. pubescens* var. *Canbyi* Blake which, however, has somewhat smaller and narrower leaves with fewer veins and glabrescent beneath and pubescent branchlets, though occasionally the under side of the leaves may be more pubescent as in a specimen from Waynesville, N. C. (Bilt-

more Herb. without no. and collector, July 27, 1903). In the pubescent underside of its leaves var. *Deamii* resembles var. *longifolium* Blake but that variety has much smaller and narrower, ovate ot ovate-oblong leaves with more numerous veins and longer teeth. From the southern *V. scabrellum* Chapm. which agrees with *V. pubescens* in the fruit and stone, var. *Deamii* is easily distinguished by the glabrous smooth branchlets. The leaves of some specimens resemble those of the following variety in shape and serration but they all have the under surface soft pubescent.

Viburnum pubescens var. **indianense,** var. nov.

Affinis var. *Canbyi* Blake sed differt ramulis novellis glabris, foliis grossius serratis dentibus fere ac longis quam latis, petiolis plerisque stipulis subulatis instructis et supra leviter vel interdum densius adpresse pilosis rarius glabrescentibus.—Folia orbiculari-ovata vel ovata, 6–9 cm. longa et 4.5–7.5 lata.

INDIANA: Clay County, ravine 3 miles north of Brazil, *C. C. Deam*, no. 38986, July 7, 1923, no. 39002, July 7 and September 19, 1923. Putnam County, 4 miles south of Russelville on wooded hillside along Racoon Creek, *E. J. Grimes*, no. 582, June 14, 1911. Lawrence County, White and Black Oak woods ¼ mile north of Mitchell, *C. C. Deam*, no. 18517, September 2, 1915 (type). Ripley County, border of a dense Beech and Sweet Gum woods 7 miles southeast of Versailles, *C. C. Deam*, nos. 16119, June 18, 1915, and 8 miles south of Versailles, no. 18838, September 9, 1915; clearing 1 mile north of Osgood, *C. C. Deam*, no. 38874, June 15, 1923. Clark County, on a bank of a creek about 2 miles northeast of Borden, *C. C. Deam*, no. 40022, October 11, 1923. Spencer County, low flat woods 2½ miles northwest of Rockport, *C. C. Deam*, no. 39971, October 4, 1923.

This variety differs from var. *Canbyi* chiefly in the presence of stipules on most of the petioles, by which character it agrees with the preceding variety; it also differs in the generally coarser serration of the leaves and the glabrous young branchlets, though occasional specimens of the latter variety show the same kind of serration and may have glabrous or glabrate branchlets. Some specimens as nos. 39002, 39971 and 40022 with smaller glabrescent leaves approach *V. dentatum* L. but may be distinguished by the presence of stipules, larger inflorescence and larger short-ellipsoidal fruit from that species which apparently never has stipules and has smaller subglobose fruit and denser smaller inflorescence.